2.0 PROJECT DESCRIPTION

This chapter of the EIAR provides details on the various elements of the proposed restoration plan for the Site in the context of the Kildare County Development Plan and East Midlands Regional Waste Management Plan. It is proposed to accept, recover and use inert waste materials to restore the Site which includes a large area of worked out sand and gravel extraction including a number of ponds to a landform that ties into the surrounding land contours with an agricultural end use as existed prior to quarrying activities. This chapter of the EIAR describes the proposed restoration operation, management and closure of the Ballinderry Pit.

2.1 The Applicant

The applicant for the Waste Licence to restore the Ballinderry Pit is GCHL Ltd (GCHL). GCHL are based in Castlewarden, Straffan, Co. Kildare and is owned by the Goode family who are an established concrete manufacturing company with sand and gravel operations in Kildare. The applicant is the land owner and the proposed restoration and inert waste recovery facility will be operated directly by GCHL.

2.2 Waste Licence Application

The Site is a worked out sand and gravel pit and there are insufficient materials on site to restore the pit in any meaningful capacity. It is intended to restore the pit to agricultural end use to tie in with surrounding land contours. Materials for restoration of the pit to these proposed contours are required to be imported from external sources mainly development site in the Kildare and greater Dublin region. The imported materials by definition will be wastes for the restoration of the Site. These waste materials will consist of inert soils and stones.

In accordance with the provisions of the Waste Management Act,1996 SI No 10 of 1996 and Waste Management (Licensing) Regulations, 2004 to 2011, the Site will require a Waste Licence for this activity as the tonnage to be used for the restoration of the Ballinderry pit exceeds 100,000 tonnes.

GCHL is applying to the Environmental Protection Agency (EPA) for a Waste Licence to recover c.1, 234, 335 tonnes of inert soil and stones for restoration of the Ballinderry Pit. This EIAR will support the Waste Licence Application.

2.3 Site Location and Context

The Application Site ('the Site') is located in the townland of Ballinderry, Carbury, Co. Kildare, approximately 5 km north of Carbury and 3.5 km south of the M4 junction near Broadford. The Site measures 13.9 hectares in total and comprises a former worked out sand and gravel pit with three ponds of varying size situated on the site.

The surrounding area is characterized by a flat to undulating landscape with elevations ranging from 80 to 100 m AOD. The lands are abounded to the south by agricultural lands and to the west by an existing sand and gravel quarry (County Kildare Reg. Ref. 99/1200). The eastern and northern boundaries are formed by local road network. The eastern boundary is also formed by a tributary of the River Glash flowing from south to north passing under the L1002 on the northern boundary at Clonuff Bridge. The L1002 runs along the eastern boundary in a north - south direction, where it crosses over the M4 motorway joins a Regional Road, the R148 to the north (Moyvalley) and the R402 to the south, a Regional Road which runs between Johnstown Bridge and Edenderry) (Figure 2.1). The lands are accessed from the L1002. The regional Site Location Plan, Drawing 001 Rev A is appended to this report.

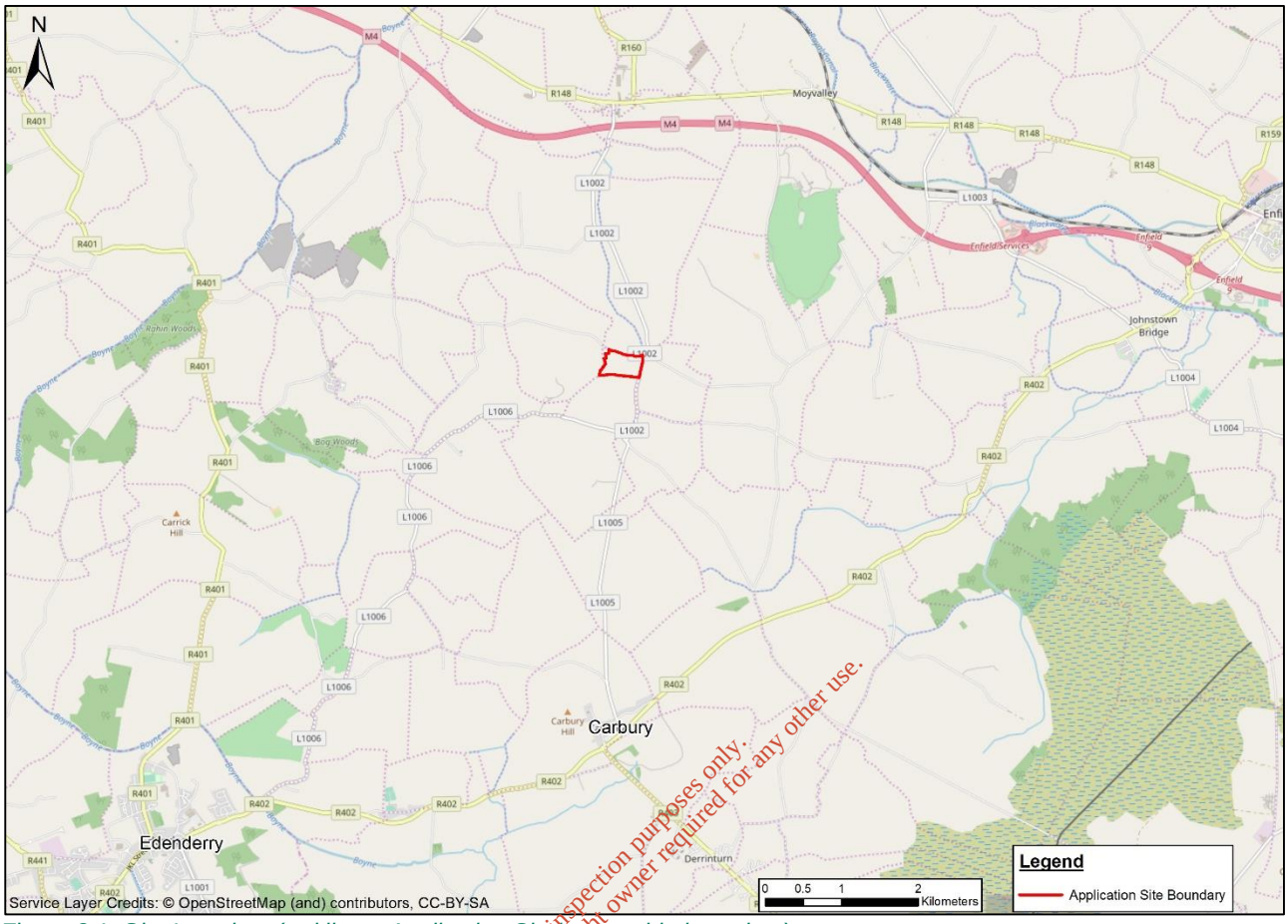


Figure 2.1: *Site Location, (red line – Application Site/ ownership boundary)*

Other lands surrounding the Application Site can be characterised as rural in nature, with land uses in the area being agricultural and single-house residential. The lands to the north, south and eastern boundaries of the Site are in agricultural use, both tillage and pasture lands. A number of farmsteads and one-off houses are located within 250 m and 500 m radius of the Site (Figure 2.2). A number of industries are also located within 2 km of the Site. Moyvalley Meats, an EPA licenced abattoir and boning hall, lies to the north east of the Site and a peat processing operation lies approximately 2 km due south of the Site.

An electricity transmission line traverses the Site southwest to northeast across the Site with one pylon situated on the Site. The local Site Location Plan is appended to this report.

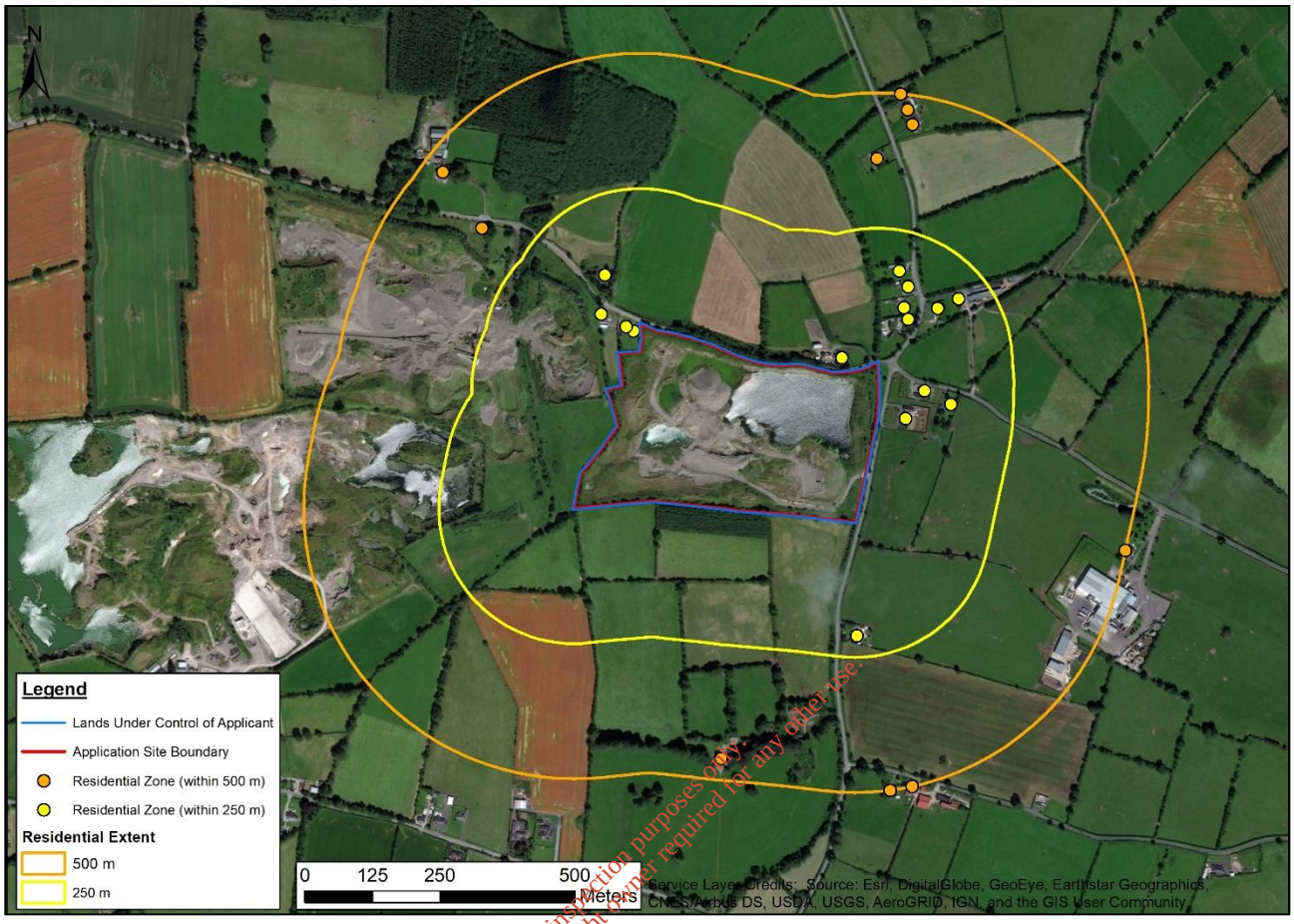


Figure 2.2: Location of farmsteads and one-off housing within 250 m and 500 m of the proposed development (red line)

2.4 Existing Conditions

An existing conditions topographic survey was carried out by Landmark Engineering and Surveying Consultants, based in Johnstown, Naas Co. Kildare in April 2018. A bathymetric survey was also carried out in April 2018 by Murphy Surveys Ltd to provide information on the depth of water in each pond and also to inform void calculations for each of the two ponds to be infilled to allow restoration of the site to the proposed restoration form. Drawing 03 RevA has been prepared from that survey and it is attached to this Report. Cross sections, drawn north south and east west through the Site show the existing ground levels (refer to attached Drawings 05).

The Site comprises a large worked out sand and gravel pit with three ponds ranging in size (Figure 2.3). The pit faces along the northern side of the site, south of road L5004, are steep, at overall inclines of approximately 1.2H:1V to 1H:1V. Soil slopes comprising gravel sand and silt are not likely to be stable in the long term at these slope inclinations and slippage is evident at the base of these slopes. The heights of the pit faces on the west and east are lower and the slope inclinations are not as steep as on the north side. There are mounds and stockpiles of topsoil, subsoil and other aggregates along the western, southern and eastern sides of the pit. The floor of the pit lies at an elevation of ca. 78 m OD with the surrounding lands to the east and south ca. 79 to 80 m OD. The ground along the western boundary rises from approximately 80 to 90 m OD and the level of road L5004 along the north side rises from east to west from 79 m OD at its junction with the road L1002 to approximately 90 m OD at the northwest corner of the site.

The central part of the Site is generally flat, with the exception of miscellaneous stockpiles of processed materials (mainly stone) on site and the landscaping berms and soil stockpiles along the western, southern and eastern boundaries. The remaining stone product on the site will be removed offsite and transported to a concrete batching facility owned by GCHL as agreed with the local authority. The estimated volume of processed aggregate on the Site is approximately 37,000 m^3.

It is understood that two ponds on site (B and C) are groundwater fed. Pond A is small in size and is seasonally dry and is considered be surface water. The levels in the other two ponds have water surfaces between 77.5 and 78.0 mOD.

Excavation of material took place beneath the water table to an estimated maximum depth of 75.0 m OD in two areas delineated by pond B and C on the Site. The largest pond, Pond No. C, has a surface area of approximately 2.65 ha and a volume of approximately 74,000 m^3 below a reference level of 78.5 m OD. Pond No. B, has a surface area of is approximately 0.29 ha and a volume of approximately 9,000 m^3 below the water level of ca. 78.5 m OD.

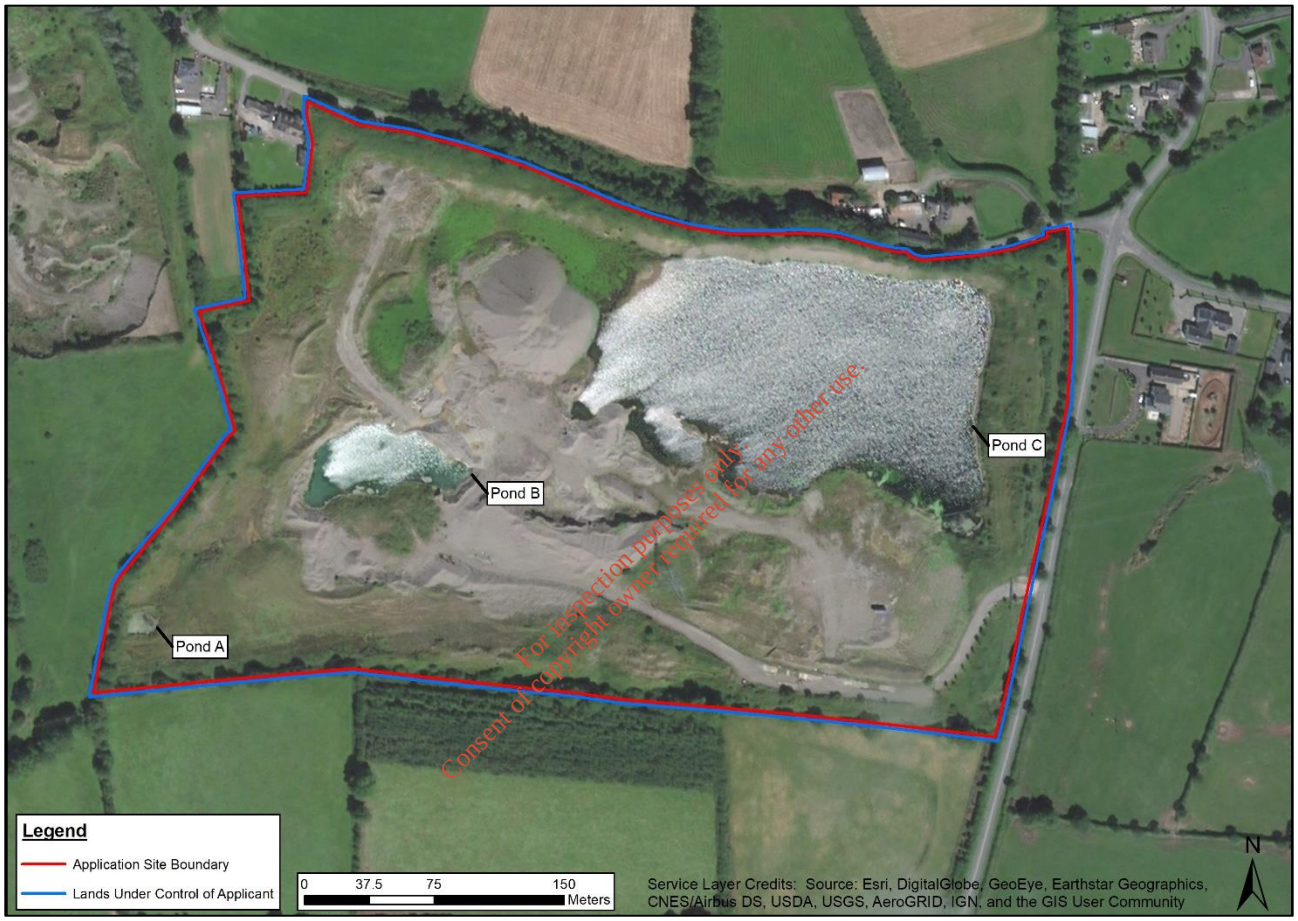


Figure 2.3: Aerial image showing the current site layout (red/blue line = application/ownership boundary)

2.5 Overview of Pit Restoration

The Site requires restoration as ordered on 21 November 2016 by the High Court under Section 160 of the Planning and development Acts, 2000 as amended (App No: 2015/383 MCA). GCHL propose to backfill the pit void with imported inert material sourced from various locations. The proposed restoration project and inert soil recovery facility at Ballinderry Pit will involve:

- Acceptance and use of approximately 1,234,335 tonnes of imported inert natural materials, comprising excess soil, stones and/or broken rock, to restore existing quarry by pit to a contoured landform that will be in keeping with the surrounding landscape;
- Installation of temporary site infrastructure and services including staff welfare facilities, hardstand areas, fuel and water storage tanks, waste inspection and quarantine facility. A weighbridge (with dedicated office) and wheel wash are existing on site;

- Construction and demolition waste (principally concrete, metal, timber, PVC pipes and plastic) imported to site mistakenly co-mingled with inert soils will be segregated prior to removal off-site to authorised waste disposal or recovery facilities;
- Temporary stockpiling of topsoil for re-use as cover material for final restoration surfaces of the site;
- Restoration of the backfilled void to ground contour levels that tie into the surrounding lands and producing a rounded hill that would be similar to the landform that existed prior to the aggregate extraction activities. The previous landform for sand and gravel extraction was an esker deposit with characteristic mound traits.
- Establishment of an agricultural grassland habitat similar to that which existed prior to quarrying of the aggregate from the site and in line with existing adjacent habitats and land uses;
- Environmental monitoring of noise, dust, surface water and groundwater for the duration of the site restoration works and for a limited period post closure.

The layout of the existing Site is shown on Drawing 03 contained in Appendix 2.1.

2.6 Waste type and Quantities

2.6.1 Waste Type and Class

The proposed backfilling of the quarry void using inert soil comprises the following classes of waste activity in accordance with the Waste Management Acts 1996 – 2015:

- Class No. R5 - recycling and reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials (Principal Activity). This activity is limited to the recovery of inert soil and stone through deposition, for the purposes of improvement and development of land.
- Class No. R13 (storage of waste pending any of the operations R1 to R12). This activity will be limited to the storage of imported wastes for recovery purposes at the facility (e.g. stockpiles of inert soil and topsoil).

It is envisaged that the following wastes (EWC codes) will be deposited (or recovered) at the facility:

- 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

2.6.2 Material Quantities Required

The estimated total volume of material required to restore the pit to final restoration contours is 685,742 m^3. This volume corresponds to approximately 1, 234,335 tonnes of inert soils and stone using a bulk conversion factor of 1.8 t/m^3. The backfilled materials will be placed and compacted by tracked bulldozer and placed materials will be further compacted by the weight of overlying material. The only material requirements in respect of the proposed restoration scheme are the inert soil, stone and rock to be used in backfilling and restoration of the existing pit void. At the present time, it is considered that the principal sources of such materials over the lifetime of the waste recovery facility will be from construction and development related activities in the greater Dublin and Kildare areas.

2.7 Site Infrastructure & Facility Services

2.7.1 Site Security

There is an existing entrance gate and adequate fencing at the entrance to the Facility located on the L1002. There is no other vehicular access points to the application site. Currently, the Site boundary is secured by post and wire fencing and/or hedgerow. Prior to commencement of the proposed quarry backfilling and restoration activities, permanent security fencing will be provided around the Site itself by enhancing existing dense hedgerows, and installing 1.2 m high post-and-wire fencing where required to ensure access is restricted to the Site.

The integrity of the fence will be checked monthly. Records of checking, maintenance and repairs to the fence will be maintained in the EMS.

2.7.2 Site Access Roads

The Site will be accessed from an existing entrance located on the Local Road L1002. Some minor cut-and-fill earthworks will be required to improve the surface of the haul roads throughout the Site in preparation for the construction of the proposed landform for acceptance of inert materials. All haul roads will be engineered and constructed of appropriate hardcore material with a maximum 10% grade to allow loaded vehicles to access the deposition area. Parking and set down areas will be constructed of hardcore material adjacent the Site office.

2.7.3 Weighbridge

A weighbridge currently exists on the Site and this will be maintained in position for the duration of the Restoration Project. This will allow weighing-in of incoming loads and weighing-out of any wastes which do not meet the acceptance criteria and are thus rejected and sent off-Site to other licensed facilities.

2.7.4 Wheel-Wash

A wheel-wash currently exists on Site. The existing wheel washing facility is a wet-grate design, located upon concrete hardstanding which will be maintained for the duration of the Restoration Project and the effluent from the wheel wash will be recycled within the system and therefore acts as a self-contained facility.

2.7.5 Fuel Storage Areas

Diesel fuel and hydraulic oil will be stored on-Site in appropriately bunded storage units. One (1 No.) 2,000 litre diesel tank is proposed, which will fuel all plant utilised for the duration of the Restoration Project. Mobile plant will use a dedicated concrete hardstanding apron for refuelling. Static plant or tracked excavators will refuel over a drip tray with an absorbent mat. In addition, spill kits will be maintained on site to deal with all spills and leaks, and spill training will be provided to relevant staff members.

2.7.6 Waste Quarantine Areas

A waste quarantine area will be provided on-Site to hold non-compliant wastes, pending removal from Site to appropriate waste disposal or recovery facilities. The quarantine area will be hardstand comprising compacted hardcore and will be suitably located. See Drawing 001 Rev A for proposed location of waste quarantine area.

2.7.7 Traffic Control

All traffic to and from the Site will use the existing entrance from the L1002. The existing Site entrance was constructed in accordance with the standards set out in the “Design Manual for Roads and Bridges”. All trucks delivering inert waste will be confined within the Site boundary. There will be no queuing on the local road network prior to unloading of wastes.

2.7.8 Sewerage Infrastructure

The Site will be supplied with temporary Portaloos provided on hardstanding adjacent the Site office and serviced as required by an appropriate waste disposal contractor. It is anticipated that this set up will be continued for the duration of the project.

2.7.9 Surface Water Drainage

All paved surfaces at the Site will drain to roadside drains and natural discharge through the sands and gravels on site. Although it is thought the backfill materials will be of mixed grain size and well sorted (and therefore allow adequate infiltration of rain water); if required, a toe-drain / surface water ditch will be installed at the lowest topographical point to manage potential runoff and sediment loading of surface waters from the depositional area. Where required, de-siltation of the drain will occur in order to manage any reduction in drainage capacity.

2.7.10 Site Accommodation

There is an existing office alongside the weighbridge (see drawing No.001 Rev A attached). The interior of this building will be refurbished and used for site management operation and will also serve as a canteen during the land-restoration project.

2.7.11 Other Services

The Facility will require power, telephone and a water supply. There are single-phase and three-phase power supplies at the Site which will be connected on receipt of the Waste Licence. This will be utilised for the duration of the Restoration Project.

Fixed overhead pole lighting will be provided in the main waste reception area and office area/compound of the Site. This lighting will be removed upon completion of the project.

Temporary mobile lighting will be used in the areas of major construction and earthworks when required. Power for this lighting will be provided by diesel generators.

There is no mains water available at the Site. A potable water tank will supplied on site for canteen facilities. A clean water tank will be supplied for washing and hygiene facilities. Water for dust suppression and wheel wash will be from the surface water supply on site.

2.8 Site Management

2.8.1 General

2.8.1.1 Working Hours

The Applicant proposes that the permitted hours of operation for the development are from 07:00 hours to 18:00 hours Monday to Friday and 07:00 hours to 14:00 hours on Saturdays, with the facility being closed on Sundays and Public/Bank Holidays.

2.8.1.2 Personnel

The Applicant proposes to employ 2 permanent employees on the site (1 weighbridge operator and 1 site operative). Additional personnel resources will be employed as required during busy periods in order to maintain the conditions of the site in accordance with requirements of any Waste licence granted.

2.8.1.3 Plant and Equipment

Plant scheduled for use in the restoration of Ballinderry pit include:

- Bull dozer;
- Excavator; and
- Water bowser (as required).

2.8.2 Waste Acceptance and Handling Procedures

2.8.2.1 Waste Acceptance

Only inert soil and stones shall be accepted at the application site. Inert materials shall be accepted at the site between 07.00 hours and 18.00 hours each weekday and 08.00 hours to 14.00 hours on Saturday. No materials shall be accepted at the Site outside of these times.

Where possible, single sources of large volumes of soil imported to site for backfilling purposes shall be identified in advance and subject to basic characterisation testing by the contractor to confirm that soils at that location can be classified as inert. The recovery facility will require all soil and stones forwarded for backfilling and recovery purposes to be free of construction or demolition waste or any non-hazardous /hazardous domestic, commercial or industrial wastes. Any waste materials that are deemed to be unacceptable for recovery at the facility on the basis of a visual inspection at the weighbridge will be rejected and will be directed away from the Site to an appropriate disposal facility. The waste acceptance methodology is presented in Table 2.1 below and is further discussed in Chapter 5 – Soils and geology..

Table 2.1: Waste Acceptance Methodology for Backfill Material (modified from EPA 2017)

Material Type	Minimum Criteria
Greenfield soil and stone:-	Letter of suitability for the first 5,000 tonnes of material received, and a further letter of suitability for each subsequent 5,000 tonnes of material received. Each letter of suitability shall be signed by a suitably qualified person and shall state the following: ■ The waste is greenfield soil and stone ■ A description of the source and nature of the soil and stone ■ The location of the source of the soil and stone (including a map showing the source site boundary) ■ The material is suitable for use as backfill within the facility ■ The material will not cause environmental pollution at the facility There is no requirement for testing greenfield soil and stone, unless directed by the Agency. However, it is advisable that the suitably qualified person relies on soil test results to confirm the greenfield status of the source site before signing the letter of suitability. When the material arrives at the soil recovery facility, a visual check is required to verify that the material is greenfield soil and stone.
Non-greenfield soil and stone:-	Prior to accepting material from each individual source site, the licensee shall obtain information on the past use of the site and shall reject non-greenfield sites where soil or groundwater contamination has been identified or where there is an increased risk of contamination being present. Soil and stone should not be accepted from sites where activities in the past have involved the manufacture or storage of hazardous substances e.g. chemical manufacturing facilities, oil storage facilities, retail filling stations. Up to 2% contamination with non-natural materials is acceptable within the soil and stone, i.e. anthropogenic or man-made substances such as rubble, concrete, bricks, metal and bitumen that are non-natural to the environment from which the material was extracted. There is no allowance for chemical contamination. Basic characterisation, compliance testing and on-site verification shall be undertaken, including waste classification. Contaminant concentrations within the soil and stone must comply with soil trigger levels agreed with the EPA.

2.8.2.2 Waste Handling

All inert soils imported to the site will be unloaded from trucks at the current deposition area. It will be visually inspected by site personnel at that point to assess that the material is visually free from physical contaminants and odours. Any non-compliant waste will be transferred to the waste inspection and quarantine area for closer inspection and classification. Should subsequent testing indicate that the quarantined materials are non-inert and cannot be accepted and used for restoration purposes at this site, they will be removed off-site by permitted waste collectors to an appropriate waste disposal facility.

2.8.2.3 Compliance Sampling and Testing

A representative sample shall be taken from one in every 100 loads of inert soil accepted at the facility and subjected to compliance testing which is less extensive than characterisation testing and focuses on key contaminant indicators. These data shall be used to confirm that the accepted soils are inert and comply with acceptance criteria. Compliance testing shall be undertaken by the Applicant. Laboratory testing of soil, will be undertaken off-site at an ILAB / UKAS accredited laboratory.

2.8.3 Capacity and Lifespan

The estimated volume of material to be placed at the application Site is approximately 685,740 m^3. This volume equates to 1,234.335 tonnes using a bulking factor of 1.8 t/m^3. This material will be required to be imported on to site for restoration purposes.

The duration of backfilling activities at the Site will largely be dictated by the rate at which externally sourced inert soil and stone is imported to the site. There are many factors which will influence this, including, but not limited to the:

- Availability of acceptable inert materials from development sites;
- economic climate and related construction industry output;
- proximity of development projects to the facility;
- planning and scheduling constraints at sites providing inert restoration materials; and
- Physical site conditions relating to weather.

Taking into account the above factors, the intake rates and duration is a best estimate. Over the short-to-medium term (>5years), it is likely significant quantities of inert soil could be sourced from mixed residential and commercial development in the greater Dublin and Kildare areas as Ireland is currently experiencing a development boom.

It is estimated that the rate of importation of inert materials to the quarry void could average around 350,000 to 400,000 tonnes per annum, with a maximum intake of 440,000 tonnes per annum should large commercial developments) or infrastructure works proceed within the surrounding catchment area at some stage over its operational life.

If an average importation rate was between 300,000 and 400,000 tonnes per annum, the expected operational life of the facility would be between 3 and 4 years. If however the rate of backfilling is less than anticipated, the recovery facility could be operational for up to 10 years.

The proposed backfilling operations at the quarry will entail importation of approximately 1,234,335 tonnes of material. This translates to approximately 68,575 HGV round trips (at 18 tonnes per load) over the lifetime of the facility in order to backfill the quarry void.

2.9 Backfilling and Restoration Plan

2.9.1 Restoration and Recovery Activities

2.9.2 Restoration Schedule

Backfilling of the application site will commence with phased infilling of the 2 larger ponds at the Site. There is a smaller pond (Pond A) to the west of the Site and this is understood to be surface water pond and is situated outside of the main restoration area. This small pond will remain untouched and serve the site as a natural water feature to support the biodiversity at the Site. Drawing No.006 Rev A contained in Appendix 2.1 presents the phasing plan for the restoration of the Ballinderry Pit.

It is intended to backfill the quarry ponds using compacted Category A inert material (subject to EPA approval). In order to backfill the ponds, dewatering will be required. The methodology currently proposed to achieve this objective aims to limit the potential effects to groundwater or surface water bodies by limiting the amount of active dewatering and discharge to surface water that will be required at any one time. Pond B will be dewatered by pumping the water overland to Pond C. The volume of pond B (to a reference level of 78.5 m OD) is calculated to be c. 9,000 m^3. Pond B will be infilled using clean inert soils and compacted in layers to an elevation of 78.5 m OD. This level is ties in to the existing floor levels at the base of the pit.

The volume of pond C is calculated to be c. 74,000 m^3. Pond C will infilled on a staged basis. To achieve this, it is proposed to construct dividing berms across the width of the water-filled void to create a number of individual sections. Water will then be pumped from one section to the adjacent section. The dewatered section will be backfilled in compacted layer of inert soil to a reference datum of 78.5 mOD.

The water discharged to the neighbouring section will be allowed to naturally discharge and re-equilibrate with groundwater levels in that section of the pond. This strategy will be employed in an iterative fashion until the pond is significantly reduced in size. The final section of Pond C for infilling will be of significantly smaller size than previous sections to reduce the amount of water to be dewatered from that section. The final phase will be dewatered to the quarry floor, where it will naturally infiltrate to ground. This allows discharge (and sediment loading) to surface waters to be avoided.

The infilling and restoration will progress upwards from the former quarry floor from C. 78.5 m OD, and on completion, the restored landform will merge into the surrounding landscape. An outline of the proposed restoration scheme and the final ground level contours is shown in Drawing 04. In addition to imported materials, some soil in existing screening berms and/or stockpiles across the existing site will be used to backfill the quarry. Cross-sections through the final landform are shown in Drawing 05.

All new, additional or replacement infrastructure required to facilitate the proposed waste recovery activities will be constructed and/or installed prior to commencement of the backfilling operations. Backfilling of the existing void will be undertaken in a number of 'lifts' from the existing quarry floor, typically ranging between 3 m and 5 m height depending on the physical nature of the inert soils being backfilled.

2.10 Final Restoration and Aftercare

The application site will be fully backfilled to as near original ground levels as possible and restored to a grassland habitat on completion of soil recovery operations. This will allow the application site to tie in with the surrounding natural landscape and existing land uses.

During and after the final phase of the quarry backfilling works, ground contours will be modified as necessary to ensure that surface water run-off across the restored site is directed to the existing surface water drainage ditch along the western boundary of the application site.

Topsoil will be imported to the site on a continual basis and shall not be used immediately in general backfilling of the quarry void. The topsoil will be stockpiled separately pending re-use toward the latter stages of the quarry backfilling works, when the top surface of the backfilled ground approaches the planned final ground levels envisaged by the restoration scheme. These materials shall be stored separately within the application site, away from the active backfilling area and in such location and manner as not to create any temporary adverse visual impact or dust nuisance. It is proposed that the lands excavated will be returned to agricultural use by dressing with ca. 0.3 m of top soil and re-seeded with an agricultural grade grass seed mixture, similar to that used on adjoining lands. Side-slopes will be 'battered down' to a gradient of 1 in 10 to allow safe construction of the restoration form.

On completion of the quarry backfilling and restoration works, all mobile plant and equipment associated with the waste recovery activities will be removed off-site. Any dedicated site accommodation, infrastructure and/or services will also be progressively decommissioned and/or removed off-site.

An aftercare period, of between 12 and 24 months (as agreed with the agency), will follow in order to ensure that vegetation becomes well established and that any bare or exposed soils are re-seeded. Thereafter, the restored lands will be used for agricultural grazing by livestock or tillage as appropriate.

Details of the proposed final restoration plan are presented in Drawing No.04 Rev A. Photomontages of the landscape prior to and after extraction of sand and gravel are presented in Chapter 9.0.

2.11 ENVIRONMENTAL NUISANCE CONTROL

2.11.1 General

Backfilling and restoration activities at the application site will require a number of environmental controls to eliminate or minimise the potential nuisance to the public arising from the importation, placement and compaction of inert soils.

The planned environmental control measures are outlined in detail in the following sections.

The quarry backfilling and restoration works to be undertaken at the application site will ultimately be regulated by conditions of a waste licence issued by the Environmental Protection Agency (EPA). Any additional control measures required by these consents, in addition to those outlined below, will also be implemented.

2.11.2 Bird Control

As the soil and stones being placed / recovered at the Application Site are free of putrescible (food / kitchen) waste, site activities are unlikely to attract scavenging birds such as gulls and crows for the duration of the restoration works. It is not intended to implement any specific bird control measures at the site. In the unlikely event that any putrescible waste is identified among imported materials, it shall be immediately removed to the waste quarantine area pending removal off-site to a licenced waste disposal or recovery facility. All canteen waste shall be located in appropriate enclosed waste containers.

2.11.3 Dust Control

Existing macadam surfaces at the entrance to the Site will significantly reduce the generation of dust at the public interface. In dry, windy weather conditions, the pit backfilling and restoration activities may give rise to dust blows from the application site to external receptors. In order to control dust emissions, the following control measures will be implemented:

- Use of the wheel-wash will ensure mud is not trafficked on pavements;
- Dust blows will be partially screened by the pit side walls and screening berms as backfilling progresses upwards;
- As the level of the backfilled materials approaches final surface levels, the site will be seeded with grass on a phased basis, as soon as practicable after placement of cover soils (subsoil and topsoil). This will help to minimise soil erosion and potential dust emissions;
- Areas of exposed soils will be kept to a minimum where practical; and
- The amount of dust or fines carried onto the public road network will be further reduced by periodic sweeping of internal paved site roads and the existing public roads, if required.

2.11.4 Litter Control

The materials being placed or recovered at this site will be largely free of litter, the site restoration activities are unlikely to give rise to problems with windblown litter. Accordingly, it is not intended to implement any specific litter control measures at the site. In the unlikely event that any litter waste is identified among imported materials, it shall be immediately removed to the waste quarantine area pending removal off-site to a licenced waste disposal or recovery facility. All canteen waste will be contained in an appropriate enclosed bin prior to disposal to an appropriate waste facility.

2.11.5 Odour Control

As the soil and stones being placed / recovered at this site are not biodegradable and will not emit odorous gases, site activities will not give rise to odour nuisance. Therefore it is not intended to implement any specific odour control measures at the site. In the unlikely event that any biodegradable waste is identified among imported materials, it shall be immediately removed to the waste quarantine area pending removal off-site to a licenced waste disposal or recovery facility.

2.11.6 Vermin Control

As the soils and stones being placed / recovered at this site are free of putrescible (food / kitchen) waste, site activities are unlikely to attract vermin (rats) for the duration of the restoration works. No specific vermin control measures shall be implemented at the site. In the unlikely event that any putrescible waste is identified among imported materials, it shall be immediately transferred to the waste quarantine area pending removal off-site to a licenced waste disposal or recovery facility. All canteen waste will be contained in an appropriate enclosed bin prior to disposal to an appropriate waste facility.

2.11.7 Fire Control

The inert soil and stone material being recovered at the site should be free of flammable materials and biodegradable waste which could create a fire risk. The risk of fire at the Site is considered to be low.

Measures for fire prevention and control shall include:

- Emergency response numbers posted in prominent positions at the Site including fire service, Gardaí, Ambulance Service and others as required;
- Any flammable waste identified or suspected in waste materials imported to site shall be immediately transferred to the waste quarantine area pending removal off-site to a licensed waste disposal or recovery facility;
- Plant and equipment will be regularly serviced to prevent over heating;
- No burning of waste shall be permitted at the Site; and
- Fire extinguishers shall be available at the Site office and with Site plant and machinery.

2.12 ENVIRONMENTAL MONITORING

2.12.1 General

An EMS (Environmental Management System) will be developed for the quarry in line with the Applicant's own internal polices and in keeping with industry best practice and statutory guidelines. The EMS will to be maintained and updated, with regular environmental monitoring of noise, dust and water quality to ensure compliance with permitted levels for the life of the proposed Application Site (see Chapters 6.0, 7.0 and 8.0 for more details).

Environmental sampling, monitoring and testing will generally be undertaken by the applicant's staff as required. All staff undertaking this activity will receive appropriate training in waste management and sampling. However, the applicant will engage the services of a professional environmental consultant if required. Records of environmental monitoring and testing will be maintained on-site and forwarded to the EPA as required under the terms of the waste licence.

2.12.2 Dust Monitoring

Dust emissions will be monitored by establishing three dust monitoring stations (D1, D2 and D3) for the duration of the proposed waste recovery activity and for a short duration thereafter. The location of the dust monitoring points are presented on Figure 2.4.

2.12.3 Ecological Monitoring

In the absence of any rare or protected species within the application site, it is considered that there is no requirement for ongoing ecological monitoring of other species during quarry backfilling and restoration operations.

2.12.4 Groundwater Monitoring

Four pre-existing groundwater monitoring wells are located within the pit. These wells are in good condition and available to be monitored, however, as backfilling activities progress, it is envisaged that borehole (GW2) will be decommissioned as it is sited central to the area of the backfilling activities

Groundwater sampling and testing of these wells will be undertaken on a biannual (ie. twice yearly) basis. Groundwater levels will also be recorded on a bi-annual basis. The location of the existing groundwater monitoring wells is indicated on Figure 2.4.

Groundwater samples will be tested for a range of physical and chemical parameters in order to assess water quality and detect possible contamination arising from proposed recovery activities. Further detail on existing baseline water quality is presented in Chapter 6 of this EIAR.

The groundwater monitoring regime will remain in place for the duration of the quarry backfilling and restoration works. Regular groundwater sampling and monitoring will be undertaken as long as backfilling activities continue and for a short period thereafter.

2.12.5 Leachate and Landfill Gas Monitoring

In the absence of biodegradable waste amongst the inert materials used to backfill and restore the application site, no leachate or landfill gas can be generated and accordingly no provision has been made for leachate or landfill gas monitoring at this facility.

2.12.6 Meteorological Monitoring

At the present time, no meterological monitoring is undertaken at the application site. It is understood that temperature, rainfall, sunshine, wind speed and direction are recorded at the weather station at Casement Aerodrome, at Baldonnel in south County Dublin, approximately 25 km northeast of the application site. It is currently envisaged that representative meteorological data will be acquired from the existing weather station at Casement Aerodrome, as and if required.

2.12.7 Noise Monitoring

Noise monitoring will be carried out at noise sensitive locations and will continue for the duration of the proposed quarry backfilling activities and for a short period thereafter.

Measurements will be undertaken using a Norsonic 140 sound meter (Serial Number: 1402742). This instrument is a Type 1 data-logging integrated sound level meter and meets the requirements of the International Electrotechnical Commission (IEC) Publication 651. This meter will be maintained in a calibrated condition. Prior to monitoring a field calibration will be completed, using the Norsonic 1251 acoustic calibrator (Serial Number: 33002). Noise monitoring locations are indicated on Figure 2.4.

2.12.8 Odour Monitoring

As the materials being placed or recovered at this site are not biodegradable and do not therefore emit odorous gases, the site restoration and recovery activities will not give rise to odour nuisance. No provision has been made for odour monitoring at this facility. Site staff will report and record any odour emissions at the site in the highly unlikely event that a complaint is made about odours emanating from the site.

2.12.9 Surface Water Monitoring

Surface water sampling and testing will be undertaken as per the requirements of any waste licence issued by the EPA. Sample locations will likely include any temporary surface water ponds or features which may either be created or form naturally at low points within the application site. Surface water monitoring locations within the application site are indicated on Figure 2.4.

Surface water samples will be tested for a wide range of physical and chemical parameters in order to assess water quality and detect possible contamination at the site. Further detail is presented in Chapter 6 of this EIAR. The surface water monitoring regime will remain in place for the duration of the quarry backfilling and restoration works and for a short period thereafter.

2.12.10 Stability and Settlement Monitoring

Temporary slopes in the backfilled soils (and existing quarry faces) will be visually inspected on an ongoing basis, at least once a month, by site staff and a record will be kept of same. Should these inspections give rise for concern, an inspection of the affected area(s) will be undertaken by a qualified geotechnical engineer and measures will be implemented to address any instability issues with the backfilling operation.

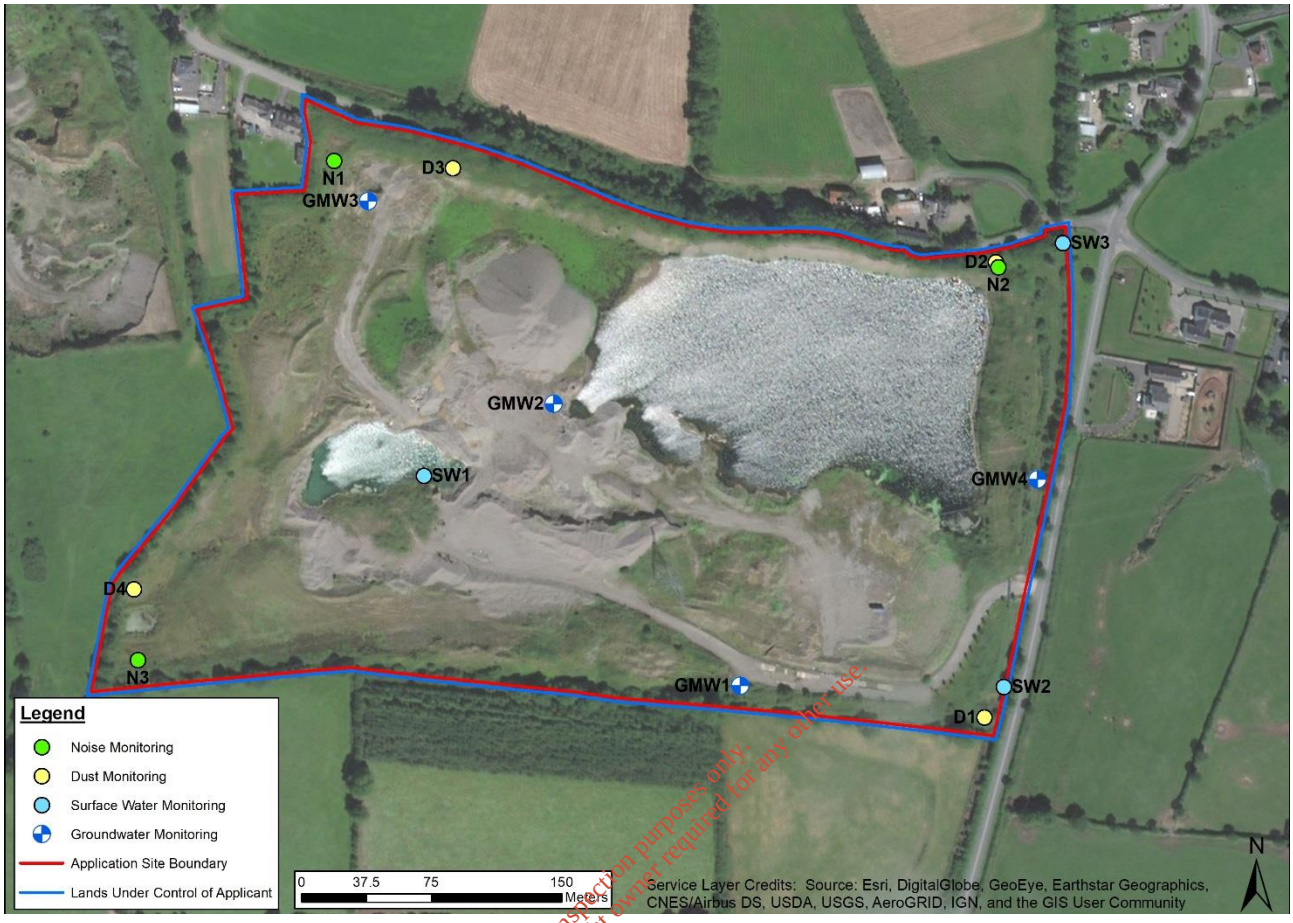


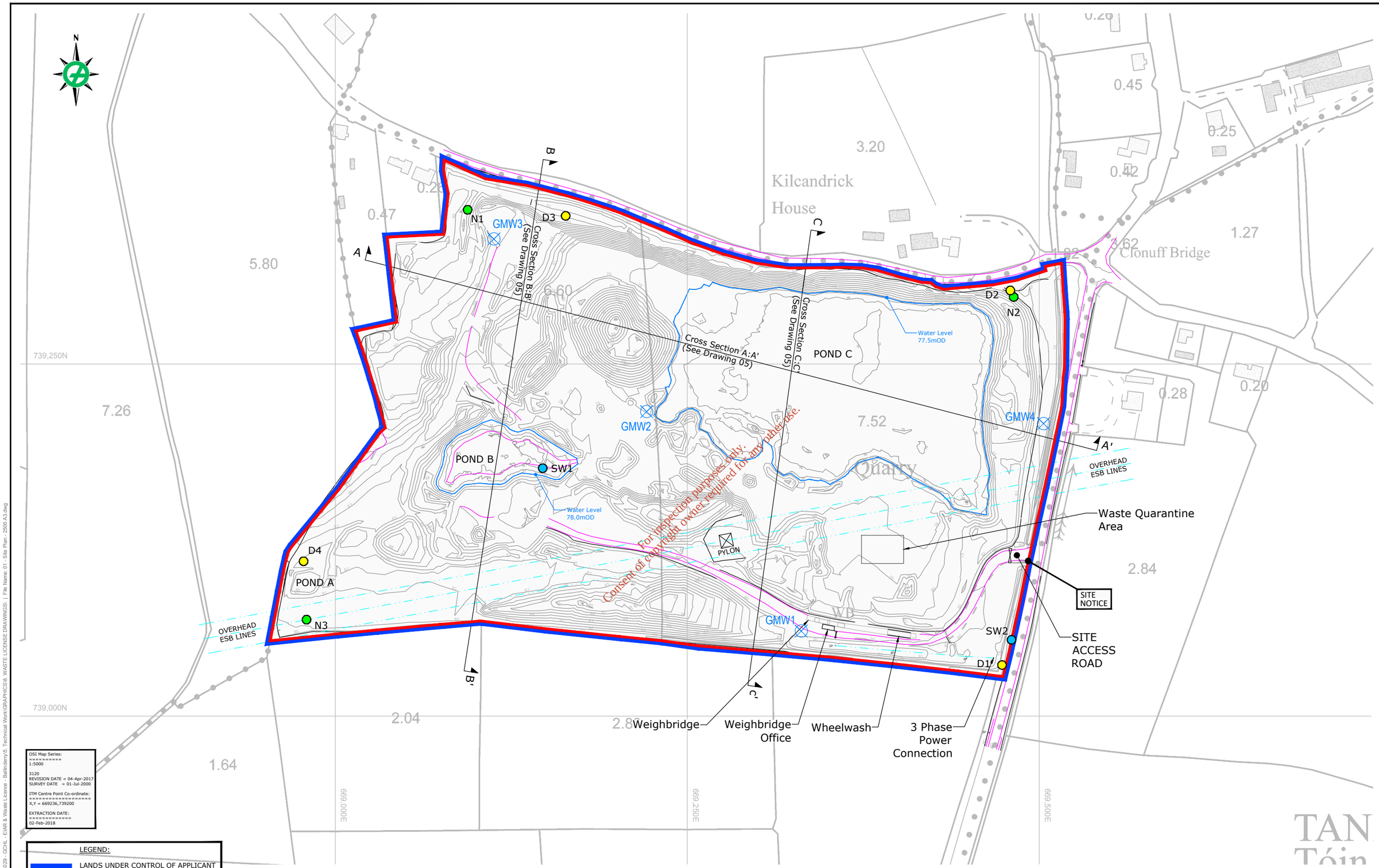
Figure 2.4: Environmental Monitoring Locations

2.13 References

- Kildare County Development Plan 2017 – 2023.
- Archaeological Code of Practice (Irish Concrete Federation, 2009).
- HSA's 'Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008.
- Geological Heritage Guidelines for the Extractive Industry (Irish Concrete Federation, 2008).
- Environmental Management in the Extractive Industry: Guidelines for Regulators 2006.
- Environmental Code (Irish Concrete Federation, 2005).
- Department of the Environment, Quarries and Ancillary Activities, Guidelines for Planning Authorities 2004.
- Environmental Management in the Extractive Industry (Non Scheduled Minerals) (Environmental Protection Agency, 2002.
- Waste Management Act,1996 SI No 10 of 1996 as amended; and
- Waste Management (Licensing) Regulations, 2004 to 2011.

APPENDIX 2.1

Drawings



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SURVEY DATE = 01-Jul-2000

ITM Centre Point Co-ordinate:
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X,Y = 669236,739200

EXTRACTION DATE:
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02-Feb-2018

LEGEND:

- LANDS UNDER CONTROL OF APPLICANT
- APPLICATION SITE BOUNDARY
- EXISTING GROUND CONTOUR (mOD)
- CROSS SECTION (See Drawing 05)
- EXISTING GROUND WATER WELL
- NOISE MONITORING
- DUST MONITORING
- SURFACE WATER MONITORING

NOTES:

GRID REFERENCES ARE IN METRES & TO ITM SYSTEM.

LEVELS ARE IN METRES & TO O.S. DATUM.

DIMENSIONS ARE IN METRES.

OSI Licence No.: AR 0056018

CLIENT

GOODE CONCRETE HOLDINGS LTD.

CONSULTANT

Golder Associates

YYYY-MM-DD	2018-May-30
PREPARED	AD
DESIGN	POB
REVIEW	BB
APPROVED	BB

PROJECT

WASTE LICENCE APPLICATION & EIAR, BALLINDERRY, Co. KILDARE.

TITLE

SITE PLAN

PROJECT No.	DRAWING No.	Rev.	SCALE
1894029	01	A	1:2,500 A3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3

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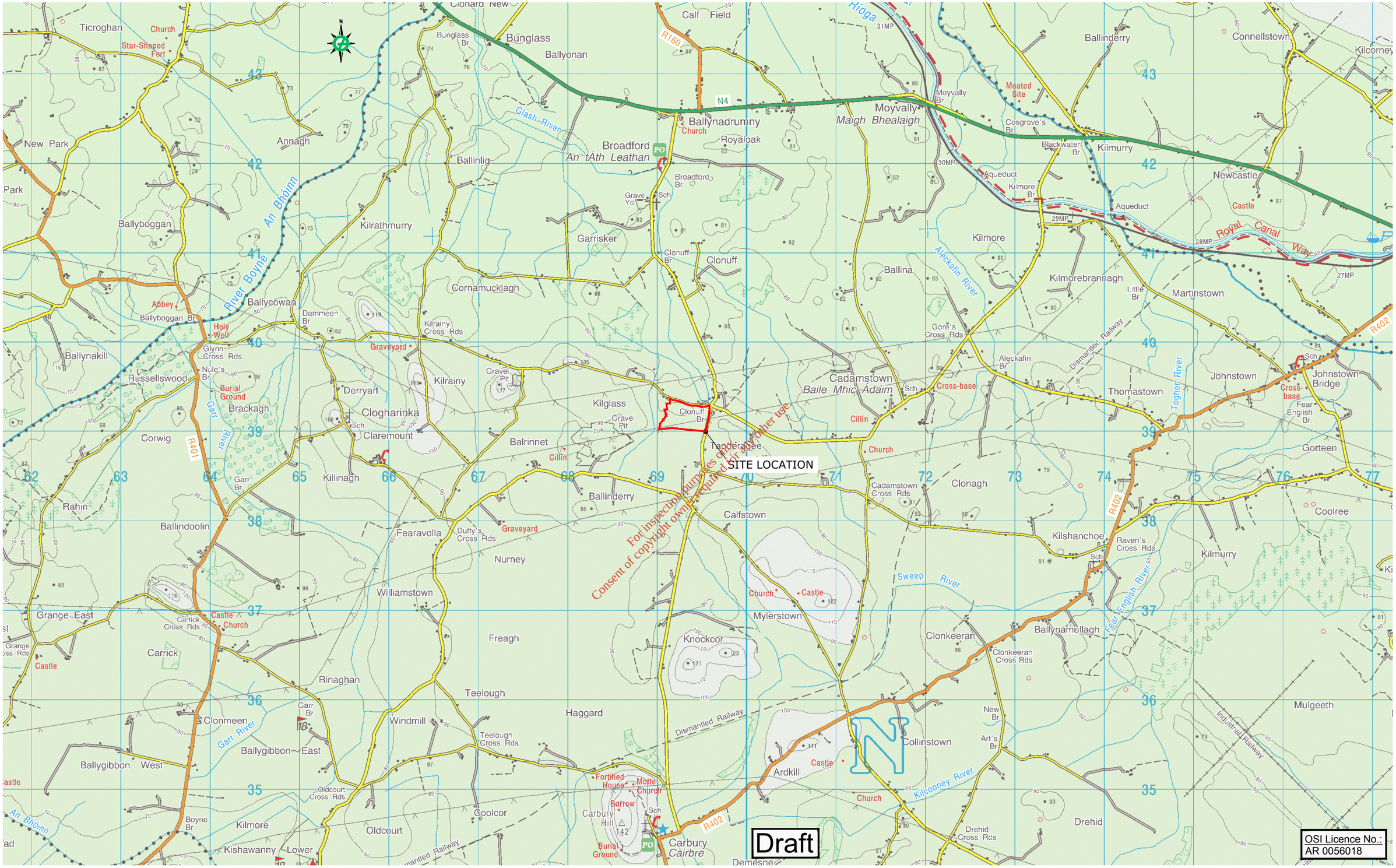

CLIENT

GOODE CONCRETE HOLDINGS LTD.

CONSULTANT

Golder Associates

YYYY-MM-DD	2018-May-14
PREPARED	AD
DESIGN	POB
REVIEW	RT
APPROVED	RT

PROJECT

WASTE LICENCE APPLICATION & EIAR, BALLINDERRY, Co. KILDARE.

TITLE

SITE LOCATION PLAN - Regional

PROJECT No.	DRAWING No.	Rev.	SCALE
1894029	01	A	1:40,000 A3

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669,250E
669,500E
739,500N
739,250N
739,000N
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0.45
0.25
0.42
3.20
Kilcandrick
House
0.26
0.47
5.80
6.60
3.62
1.27
Clonuff Bridge
1.92
0.28
0.20
7.26
7.52
Quarry
2.84
SITE
NOTICE
WB
2.04
2.83
1.64

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1:2,500

LEGEND:
- LANDS UNDER CONTROL OF APPLICANT
- APPLICATION SITE BOUNDARY
- TOWNLAND BOUNDARY

NOTES:

GRID REFERENCES ARE IN METRES & TO ITM GRID SYSTEM

LEVELS ARE IN METRES & TO O.S. DATUM.

DIMENSIONS ARE IN METRES.

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Golder Associates

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PREPARED	AD
DESIGN	POB
REVIEW	RT
APPROVED	RT

PROJECT
WASTE LICENCE APPLICATION & EIAR, BALLINDERRY, Co. KILDARE.

TITLE
SITE LOCATION PLAN - Local

PROJECT No.	DRAWING No.	Rev.	SCALE
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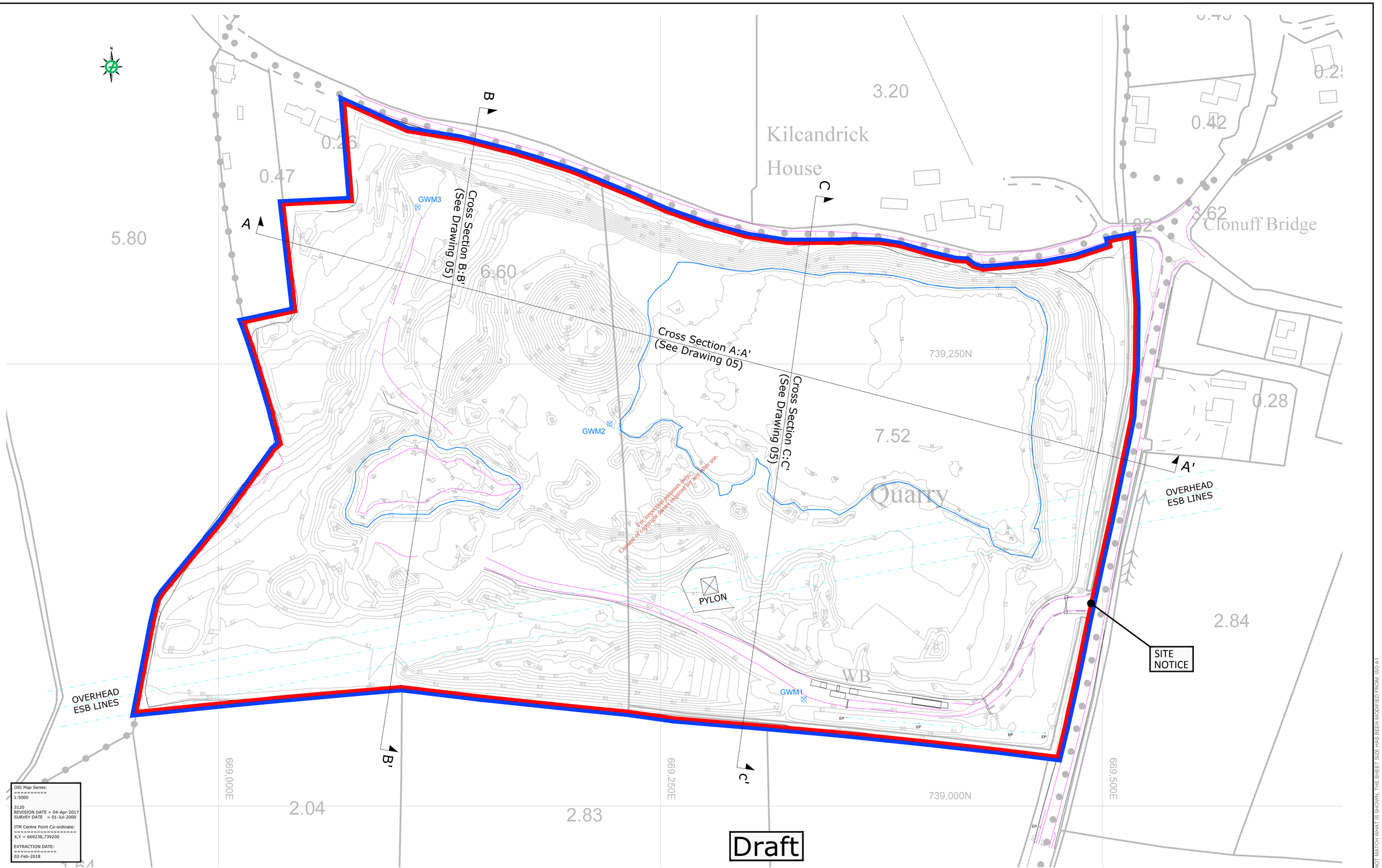

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SURVEY DATE = 01-Jul-2000

ITM Centre Point Co-ordinate:
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X,Y = 669236,739200

EXTRACTION DATE:
==========
02-Feb-2018

LEGEND:

- LANDS UNDER CONTROL OF APPLICANT
- APPLICATION SITE BOUNDARY
- 35 EXISTING GROUND CONTOUR (mOD)
- CROSS SECTION (See Drawing 05)
- EXISTING GROUND WATER WELL

NOTES:

GRID REFERENCES ARE IN METRES & TO ITM SYSTEM.

LEVELS ARE IN METRES & TO O.S. DATUM.

DIMENSIONS ARE IN METRES.

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1:1,000

OSI Licence No.: AR 0056018

Draft

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CONSULTANT

Golder Associates

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PREPARED	AD
DESIGN	POB
REVIEW	RT
APPROVED	RT

PROJECT

WASTE LICENCE APPLICATION & EIAR, BALLINDERRY, Co. KILDARE.

TITLE

EXISTING CONDITIONS

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EXTRACTION DATE:
==========
02-Feb-2018

LEGEND:

- LANDS UNDER CONTROL OF APPLICANT
- APPLICATION SITE BOUNDARY
- 35 EXISTING GROUND CONTOUR (mOD)
- CROSS SECTION (See Drawing 05)

NOTES:

GRID REFERENCES ARE IN METRES & TO ITM SYSTEM.

LEVELS ARE IN METRES & TO O.S. DATUM.

DIMENSIONS ARE IN METRES.

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OSI Licence No.:
AR 0056018

Draft

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CONSULTANT

Golder Associates

YYYY-MM-DD	2018-May-14
PREPARED	AD
DESIGN	POB
REVIEW	RT
APPROVED	RT

PROJECT

WASTE LICENCE APPLICATION AND EIAR,
BALLINDERRY, Co. KILDARE.

TITLE

RESTORATION PLAN

PROJECT No.	DRAWING No.	Rev.	SCALE
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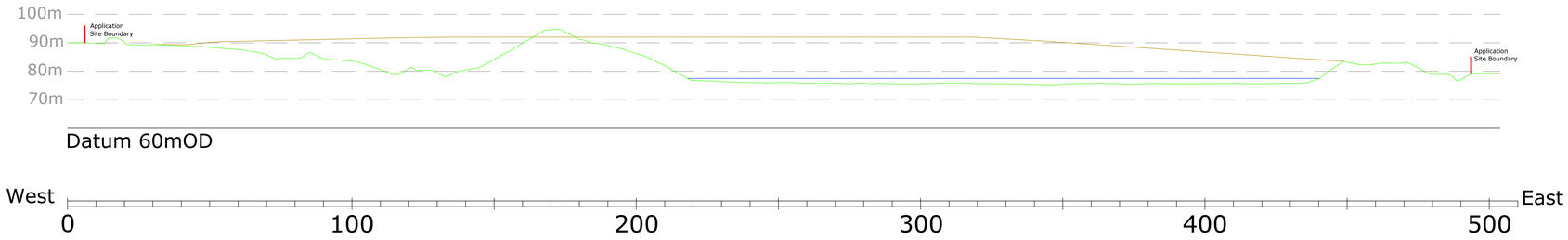

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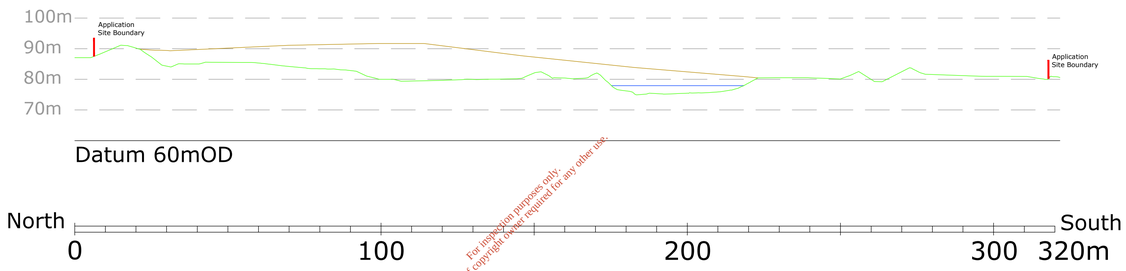

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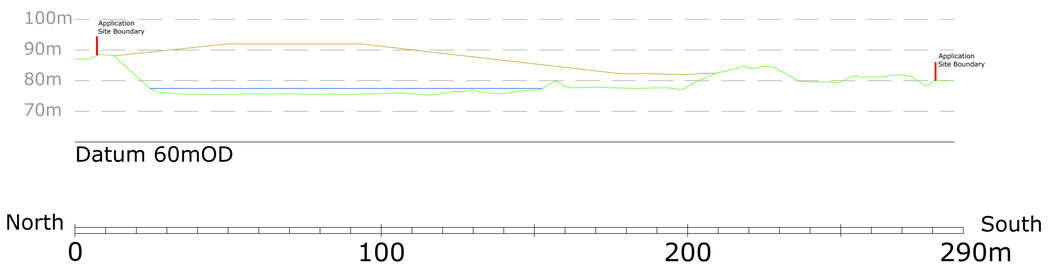

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SURVEY DATE = 01-Jul-2000

ITM Centre Point Co-ordinate:
X,Y = 669236,739200

EXTRACTION DATE:
02-Feb-2018

LEGEND:

- EXISTING GROUND LEVEL (mOD)
- EXISTING WATER LEVEL (mOD)
- PROPOSED LEVEL (mOD)
- RESTORATION LEVEL (mOD)

NOTES:

GRID REFERENCES ARE IN METRES & TO ITM SYSTEM.

LEVELS ARE IN METRES & TO O.S. DATUM.

DIMENSIONS ARE IN METRES.

REFER TO DRAWINGS 03 & 04 FOR SECTION LOCATIONS

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OSI Licence No.:
AR 0056018

CLIENT
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CONSULTANT
Golder Associates

YYYY-MM-DD	2018-May-14
PREPARED	AD
DESIGN	POB
REVIEW	RT
APPROVED	RT

PROJECT
WASTE LICENCE APPLICATION AND EIAR, BALLINDERRY, Co. KILDARE.

TITLE
CROSS SECTION DETAILS

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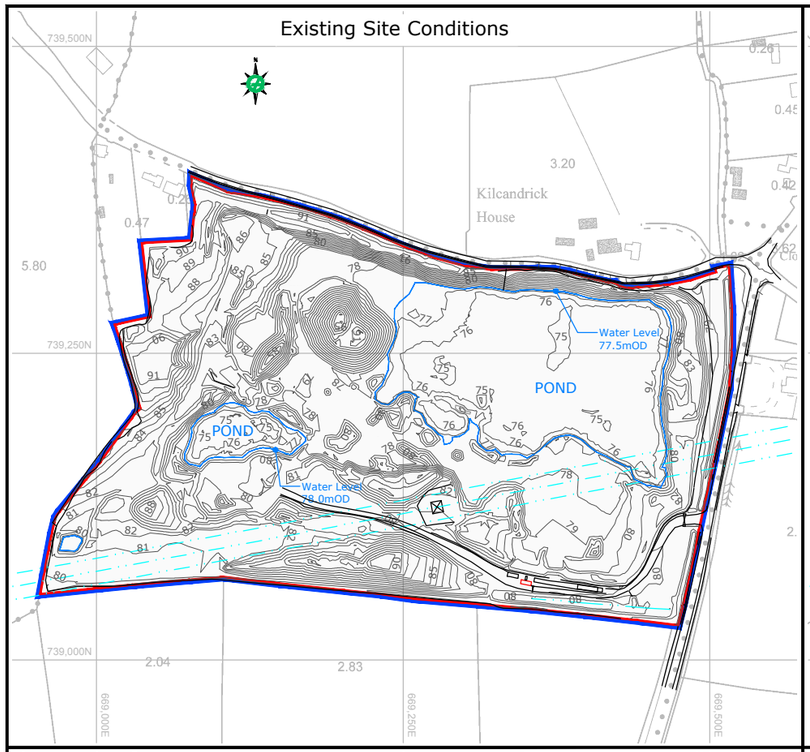
Existing Site Conditions



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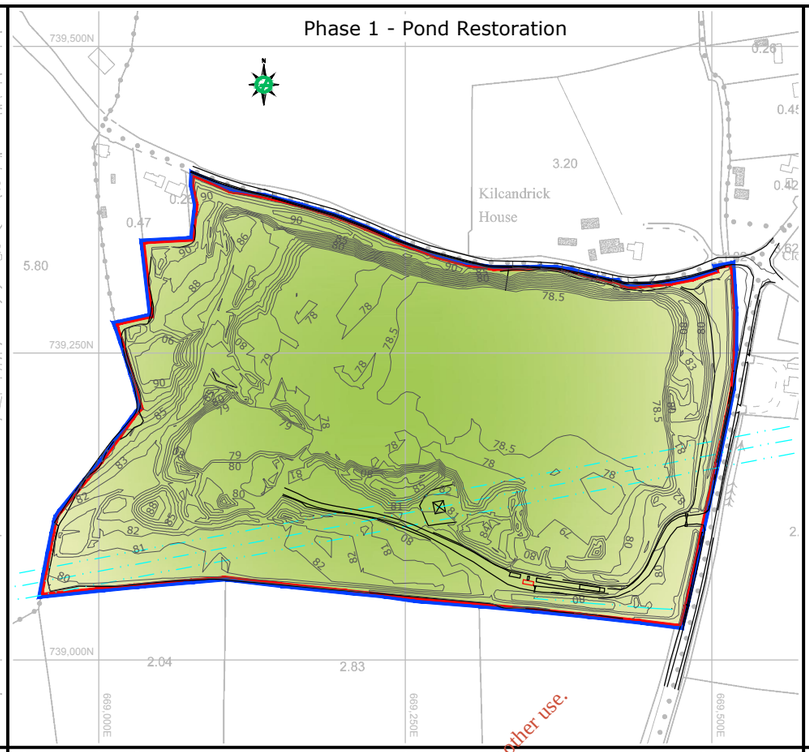
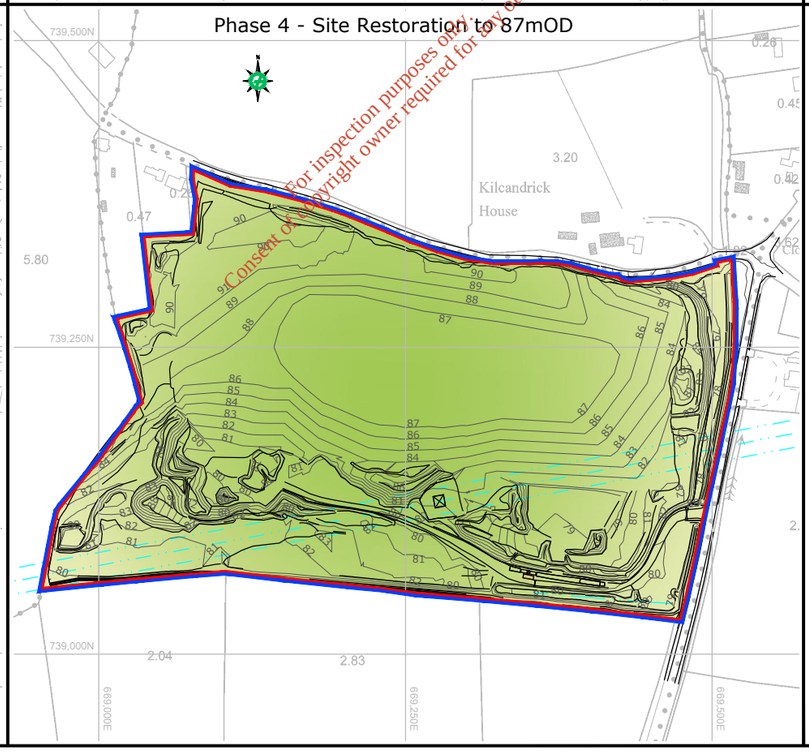


Phase 2 - Site Restoration to 81.5mOD

Phase 3 - Site Restoration to 84mOD

Phase 4 - Site Restoration to 87mOD



Phase 5 - Final Restoration to 92mOD

LEGEND:

- LANDS UNDER CONTROL OF APPLICANT
- APPLICATION SITE BOUNDARY
- 35 GROUND CONTOUR (mOD)
- OVERHEAD POWER LINES

NOTES:

GRID REFERENCES ARE IN METRES & TO ITM SYSTEM.

LEVELS ARE IN METRES & TO O.S. DATUM.

DIMENSIONS ARE IN METRES.

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1:2,500

OSI Licence No.: AR 0056018

OSI Map Series:
1:5000

3120
REVISION DATE = 04-Apr-2017
SURVEY DATE = 01-Jul-2000

ITM Centre Point Co-ordinate:
X,Y = 669236,739200

EXTRACTION DATE:
02-Feb-2018

CLIENT

GOODE CONCRETE HOLDINGS LTD.

CONSULTANT

Golder Associates

YYYY-MM-DD	2018-May-21
PREPARED	AD
DESIGN	POB
REVIEW	RT
APPROVED	RT

PROJECT

WASTE LICENCE APPLICATION AND EIAR, BALLINDERRY, Co. KILDARE.

TITLE

PHASING PLAN

PROJECT No.	DRAWING No.	Rev.	SCALE
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