

REMEDIAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT NON-TECHNICAL SUMMARY

SUBSTITUTE CONSENT APPLICATION FOR AN EXISTING
SAND AND GRAVEL PIT AT
ROSCAT, TULLOW,
CO. CARLOW

Prepared For:



Prepared By:

Earth Science Partnership Ire. Ltd
Tonranny
Westport
Co. Mayo
April 2019

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1.0 Introduction

This remedial Environmental Impact Assessment Report (rEIAR) has been prepared to accompany an application for substitute consent to An Bord Pleanála regarding the historic development of a sand and gravel pit of approximately 4.7ha in area located at Roscat, Tullow, Co. Carlow. The location of the pit is illustrated on NTS Figure 1 and 2 located at the end of this report.

The application site forms part of an existing sand and gravel pit which is approximately 6 hectares in area. Planning permission for an area of approximately 1.3ha granted in 1987 (CW 7850) exists in the south eastern section of the site. The existing sand and gravel pit area was registered with Carlow County Council in accordance with the requirements of Section 261 of the Planning and Development Act, 2000 (Quarry Ref. No. QY12/28). An area of approximately 6.02ha of the landholding was registered in this process.

The application site is located in the townland of Roscat which is approximately 3 km south west of Tullow and 2 km east of Rathtoe. The N81 national road which connects Tullow with the N80 at Ballon passes in a north-south direction 1.5 km east of the site. Vehicular access to the pit is off a local road and via a c.1km long gated laneway that provides access to the pit and surrounding lands. The site is surrounded by agricultural fields.

In accordance with Section 261A (10) of the Planning and Development Act 2000 (as amended), the owner/operator on foot of the previously set aside decision by An Bord Pleanála was issued with a notice by the Planning Authority directing the owner/operator to submit an application for Substitute Consent to An Bord Pleanála and the application should be accompanied by a rEIS (now rEIAR) and rNIS as confirmed by An Bord Pleanála.

The site is situated on the eastern side of a minor valley which is defined by a small north-south trending ridge that peaks at 94 mOD, 1 km northeast of the site at Ellengrove Crossroads, and a wider area of raised ground which reaches 93 mOD, 1.8 km southwest of the site. This valley flattens out to less than 70 mOD a short distance southwest of the site. OS Discovery maps indicate the site elevation to be in the range 68 – 74 mOD.

The area immediately around the site is sparsely populated, with individual farmsteads and scattered houses along the road network. A series of irregular third class roads run around the lands, serving a number of dwellings and farms.

Kilcarrig Quarries Ltd. the owner of the application site are a long established company which has been supplying materials to the civil engineering and construction industries based locally and regionally for the past 30 years.

2.0 Screening Scoping & Alternatives

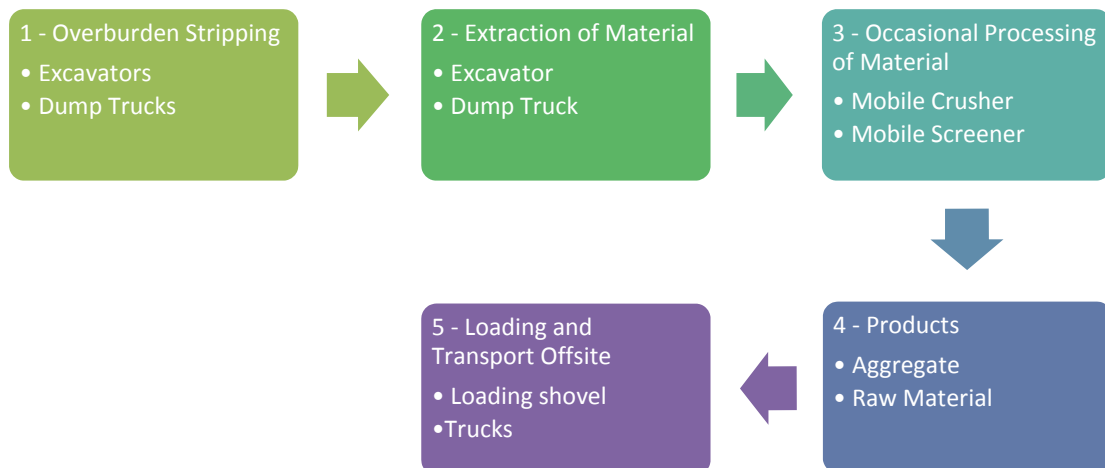
A scoping exercise was conducted as part of the planning application process to establish the range and aspects of the environment to be considered as part of the planning application as well as all topics specified in the Environmental Impact Assessment Regulations and guidance documents. A Screening & Scoping Document was compiled and forwarded on to the relevant stakeholders for comment.

Based on discussion and comments from the design team and various third parties, assessments were undertaken in relation to the various elements of the environment to assess any potential impacts associated with the proposed development.

3.0 Description of the Development

Plate 1 gives a summary of the activities that were undertaken within the Substitute Consent application site and the authorised pit area when it was operational and are described under each subsection.

Plate 1: Flowchart Describing Activities Undertaken at the Quarry



Overburden Stripping

Overburden was removed within the existing pit area in order to excavate the underlying sand and gravel material. This material was removed using an excavator and dump trucks and stored on site for restoration of the pit on completion of removal of the available resource.

Extraction of Material

Once the overburden was removed, the sand and gravel material was extracted using excavators. The material was fed into the processing plant or loaded directly onto road trucks for exportation offsite to an external processing plant.

Occasional Processing of Material

Material was crushed onsite where required and screened into a number of grades depending on the market requirements. Processing was undertaken using mobile plant set up close to the excavation area.

Products

Processed aggregate was sold to the client's requirements. Once processed, the aggregate was stockpiled awaiting transport to market. Material was also extracted, loaded onto road trucks and exported offsite to an external processing plant.

Transportation of Material

Material was loaded onto road trucks using wheel loaders and transported off-site.

Description of On-Site Plant

The following plant and equipment was used during past activities at the pit:

- Excavators
- Mobile crusher
- Mobile screeners
- Dump trucks
- Wheel loaders
- Tractor and bowser
- Road trucks

Fuel and Chemical Storage

No fuel was stored at the pit. Fuel was delivered to the pit by licensed oil companies and dispensed into plant and machinery.

Surface and Groundwater Management

All surface water generated as a result of precipitation at the Substitute Consent area followed a number of routes. The majority of the existing site has been stripped of overburden and is primarily underlain by sand and gravel. Precipitation falling on the site followed one of the following routes:

- Percolated through the underlying sand and gravel layers to ground.
- Flowed towards shallow depressions and evaporated off during over time dry periods.
- Directed to the settlement lagoons located in the south eastern corner of the pit where water was retained and used for dust suppression with excess water directed off-site.

Working Hours and Employment

Operating hours for the development were between 0700 hours and 1900 hours Monday to Friday and 0730 to 1700 hour on Saturdays as per Section 261 conditions. The pit did not operate outside these hours or on Sundays or Public Holidays. The pit provided employment for approximately 1 person on a part-time basis.

Utilities and Services

There were no electrical or telecommunications connection at the pit during its operation. Water for dust suppression purposes was sourced from the settlement lagoons on-site.

Transport and Access

Access to the pit is gained from the N81 national road which connects Tullow with the N80 at Ballon. Access to the pit is via a haul road which is approximately 1 km in length which links the pit to the N81. This access road consisted of a paved road which was constructed of a wearing surface course of macadam which remains in place.

Offices and Facilities

A porta-cabin facility was located within the application site for staff usage. Due to the low level of activity and traffic movements, no wheel-wash or weighbridge facilities were located at the existing site.

Waste Management

All overburden material arising from the quarry site has been used for screening berms around the boundary of the quarry or stockpiled on site. Waste metal and vehicles were sent to a registered waste recovery facility for recycling.

Safety and Security

Stock proof post and wire fencing was in place around the boundary of the landholding during the operation of the pit and remains in place currently. The gate located at the entrance to the site was locked outside working hours. Warning signs were in place around the pit.

Resource

Within the Substitute Consent area, the extraction of material to date resulted in the removal of approximately 16,800 m³ of overburden material which is stockpiled on the pit floor for restoring the pit on completion of works. Approximately 214,000 m³ of sand and gravel material was extracted from the pit which was processed on-site and sold as aggregate or extracted and directly loaded onto vehicles and transported off-site. Using a conversion factor of 2 tonnes/m³, the annual average extraction rate is estimated to be 50,000 tonnes per annum (25,000m³ per annum).

Dust Generation and Control

During the operation of the Substitute Consent area, the extraction and processing of material and vehicle movement would have had the potential to create wind-blown dust if it was not managed effectively. Dust generation and control are dealt with within Chapter 10.0 (Air). All necessary precautions would have been put in place to ensure that the operations at the pit did not impact significantly on the local environment.

Noise Generation and Control

Sources of noise as a result of day to day activities being undertaken were associated with extraction and processing of material and vehicle movement. All necessary precautions would have been put in place to ensure that the operations at the pit did not impact significantly on the local environment.

Landscape, Restoration, Decommissioning and Aftercare

As the excavation of material at the existing pit has resulted in the creation of a void, it is important that the area is restored on completion of extraction and other activities. A Landscape and Restoration Plan for the site is proposed and consists of the following:

1. All plant and machinery where present will be removed off the site.
2. Landscaping works will be undertaken where required.
3. All site boundaries will be secured.
4. Overburden will be spread on the floor of the pit, seeded and restored to agricultural land.
5. Additional planting of trees and shrubs will be undertaken where required.

4.0 Planning & Legislative Framework

This section of the EIAR sets out the planning and development context relating to the quarry development and reviews the national, regional and local planning policy relevant to the development.

In recent years, there has been a conscious move in Ireland towards strategic planning with various policy documents and plans introduced over the years to support strategic planning and development. Policies and objectives of the Government are contained in documents such as Sustainable Development: a Strategy for Ireland (1997), National Spatial Strategy 2002 – 2020 (NSS) and more recently Project Ireland 2040. These in turn have derived their authority from higher order World and European Union (EU) agreed agendas and directives. Policy support filters down from national and regional levels through to specific Regional Assembly Plans, County Development Plans and Local Area Plans (LAPs) where applicable.

The County Development Plan (CDP) sets out a strategic spatial framework for the proper planning and sustainable development of County Carlow for the period between 2015 and 2021 and for the

term beyond 2021. A number of planning permissions are attached to the pit. This application is being submitted in order to regularise an area of 4.7 hectares of the existing pit area.

5.0 Population & Human Health

This chapter of the EIA Report considers the potential effects of the previous activity of the development on human beings living, working and visiting in the vicinity of the existing development.

The application site is located in the townland of Roscat, Tullow, Co. Carlow. The application area is situated within the Electoral Division (ED) of Tullowbeg (Small Area Population (SAP) 340901046). The nearest urban centre is the village of Tullow, Co. Carlow, which is located approximately 3km to the northeast of the sand and gravel pit. Carlow town, the nearest large urban centre, is located approximately 16km to the northwest of the site.

Based on the latest census data (CSO, 2016), a total of 622 persons resided in the Tullowbeg SAP on Census Night in 2016. The majority of the populations of the SAP live in one off houses and farmsteads, which are sparsely populated throughout the SAP.

The assessment of impacts on human beings considers the impact of the development on population and settlement, land use, employment and other impacts of a social and economic nature. The likely significant effects on Population & Human Health associated with the development relate to the issues of socio-economic activity, human health and safety and nuisance relating to emissions from the pit, specifically in relation to dust, noise, water etc.. The various assessments undertaken indicated that there were no significant negative impacts arising from the previous activities undertaken at the development on Population & Human Health.

6.0 Biodiversity

This section appraises the likely significant effects of historic operational works of the existing sand and gravel pit on the receiving environment. The area of study included the application site, which is 4.7 hectares and forms part of an existing sand and gravel pit which is approximately 6 hectares in area. The study area also included important habitats within the “zone of influence”.

The zone of influence is defined as the area in which the proposed development has the potential to result in direct or indirect effects on biodiversity. This size and shape of this zone varies according to the particular ecological receptor being evaluated. For example, all sites designated for national (NHAs/pNHAs) and EU (Natura 2000 network) nature conservation located within a 15km radius, in addition to those beyond 15km which are identified as being hydrologically connected to the proposed application area, were included and evaluated.

The following 3 EU designated sites (3 Special Areas of Conservation – SACs) are located within a 15km radius of the proposed application area (listed from closest (1.8km) to farthest (14.2km) in distance):

- Slaney River Valley SAC (Site Code: 000781)
- River Barrow And River Nore SAC (Site Code: 002162)
- Blackstairs Mountains SAC (Site Code: 000770)

There are no Natural Heritage Areas (NHAs) located within a 15km radius of the proposed application area. The following 8 proposed Natural Heritage Areas (pNHAs) located within a 15km radius of the proposed application area (listed from closest (0.01km) to farthest (14.5km) in distance):

- Ardristan Fen pNHA (Site Code: 000788)
- Slaney River Valley pNHA (Site Code: 000781)
- Oakpark pNHA (Site Code: 000810)
- Cloghrstick Wood pNHA (Site Code: 000806)
- Ballymoon Esker pNHA (Site Code: 000797)
- John's Hill pNHA (Site Code: 000808)
- Blackstairs Mountains pNHA (Site Code: 000770)
- Baggot's Wood pNHA (Site Code: 000792)

The Biodiversity chapter includes the following description and assessment of the biodiversity within the application area:

- Baseline ecological data was collated through a detailed field visit to the subject site and surrounding areas by Senior Ecologist, Ms. Sarah Ingham MSc. ACIEEM of Earth Science Partnership Ireland (ESPI) 25th May 2018.
- A Phase I habitat survey was undertaken to inform an ecological evaluation of the habitats present within the proposed development site in accordance with methods outlined in the Heritage Council publication, *“Guidance for Habitat Survey and Mapping”* (Smith *et al.*, 2011).
- Habitats were recorded using the habitat classification scheme published by the Heritage Council in *A Guide to Habitats in Ireland* (Fossitt, 2000) and evaluated using the geographical frame of reference scheme as per *“Guidelines for Assessment of Ecological Impacts of National Road Schemes”* (NRA, 2009).
- Other ecological receptors such as birds, non-volant mammals, bats, amphibians, reptiles and invertebrates were also recorded during the site walkover, as per best practice survey methods.
- Within the subject site, the habitat classified as “arable crops (BC1)” is the dominant habitat.

- Pockets of scrub (WS1) and mature hedgerow (WL1) have also developed along the boundaries of the proposed application area.
- This mono-culture arable plantation is considered to be of low ecological value and as such, is classified as being of Local importance (Lower value).
- Given its importance to breeding birds, scrub and hedgerow are evaluated as being of Local Importance (Higher Value).
- A breeding Sand Martin (*Riparia riparia*) colony exists in a large stockpile of sand which has been classified as “exposed sand, gravel or till (ED1)”. There were approximately 50 nest entrances recorded within the colony.
- Given that presence of a breeding colony of Sand Martin within this habitat, onsite exposed sand, gravel and till is considered to be of Local Importance (Higher Value).
- All habitats that are in and around the subject site were assessed and mitigation measures were included where appropriate.

Following a detailed ecological impact assessment of the application site, it is concluded that the development did not have any significant residual effects on biodiversity assuming the mitigation measures outlined herein are strictly adhered to during continuing operations at the pit.

It is recommended that the proposed operational works are monitored periodically, particularly during the bird breeding to ensure that the mitigation proposed is implemented and that the conservation interests within the receiving environment are effectively protected. Ongoing monitoring of water quality will also be undertaken.

No hedgerow removal took place within the Substitute Consent area. As such, retrospective direct and indirect effects by virtue of disturbance/displacement on general breeding bird species using this habitat would have been imperceptible in the long-term.

Given the absence of suitable habitat for protected mammal species within the Substitute Consent area prior to operations and the site’s limited ecological value, the potential for indirect effects on non-volant mammal species utilizing the Substitute Consent area by virtue of direct loss of breeding and/or foraging habitat, in addition to noise and vibration from operational excavation activities resulting in disturbance/displacement would have been imperceptible in the long-term.

Given that habitats within the Substitute Consent area were of limited ecological value to bats and that there is no suitable roosting habitat within 150m of the Substitute Consent area, the potential for indirect effects on bat species utilizing the Substitute Consent area by virtue of direct loss of foraging habitat, in addition to noise, vibration and lighting from operational excavation activities resulting in disturbance/displacement would have been imperceptible in the long-term.

Given the limited size of the wet grassland habitat available prior to works as well as the absence of waterbodies for potential breeding purposes, it is considered that the potential for significant

retrospective direct and indirect effects of operations in the Substitute Consent area would have been imperceptible for amphibians and reptiles.

Given the limited availability of suitable habitat for breeding and foraging invertebrates within the Substitute Consent prior to excavation operations, potential for significant retrospective direct or indirect effects on invertebrate species would have been imperceptible in the long-term.

Following a detailed ecological impact assessment of the Substitute Consent application, it is concluded that the historical extension of the existing sand and gravel pit at Roscat, Tullow, Co. Carlow did not have any significant residual effects assuming the mitigation measures were strictly adhered to during operations at the pit.

Impacts of historical activities on the hydrological and hydrogeological environment and their potential consequential ecological effects were assessed, and appropriate remedial measures have been presented.

Ardristan Fen has contracted significantly in the latter part of the last century due to arterial drainage, implemented to restore peats to productive grassland soils. Water quality in the fen also appears to have been affected by nutrient inputs. There were no nutrient sources in previous activities and these are assumed instead to come from local agriculture. Hence any impacts to the fen appear to have been from local agricultural practices rather than historical activities at the working pit.

7.0 Land, Soils and Geology

In terms of regional topography, lands within a 6 km radius of the site form part of a broad valley partially confined by the following features:

- a narrow north-south trending ridge 7km to the west, that peaks locally at 195 mOD;
- the southern extents of the Wicklow Mountains 11.5 km to the east, which peak locally to the east at Aghowle Upper (420 mOD);
- to the northeast by lands which rise gradually through Tullow and Rathvilly;
- the northern limits of the Blackstairs Mountains 13 km to the south which peak locally at Croaghaun (455 mOD). Another small hill is noted 5 km south of the site at Ballon (131 mOD).

At a more local scale, the site is situated on the eastern side of a minor valley which is defined by a small north-south trending ridge that peaks at 94 mOD, 1 km northeast of the site at Ellengrove Crossroads, and a wider area of raised ground which reaches 93 mOD, 1.8 km southwest of the site. This valley flattens out to less than 70 mOD a short distance southwest of the site. OS Discovery maps indicate site elevation to be in the range 68 – 74 mOD.

Natural ground levels adjacent to the northeastern and southwestern boundaries of the existing working pit are 70 mOD and 61.7 mOD, respectively. The current floor of the existing pit is reasonably level with elevations generally between 62 – 64 mOD. Hence it has been deduced that land in the existing working pit has been lowered by a maximum of 7 m.

Soils of County Carlow (Conry and Ryan, 1967) show that soils at the site belong to the shallower sub-group Broughillstown Complex Series. These have developed on esker hummocks and are described as gravelly sandy (coarse) loams, classified as Brown Earths. The profile is characterised by a dark greyish-brown, friable and crumb-structured upper horizon of depth 150 – 250 mm, which passes directly into the coarser-textured, calcareous parent material. These soils are shown to have a wide-use range but are best suited to tillage. They exhibit moderate to rapid permeability which can develop a moisture deficit during dry periods, resulting in crops maturing unevenly.

Soils observed in-situ over exposed faces were noted as being thin. Soils have been stripped in order to facilitate extraction of overburden during previous activities. This stripped material has been stockpiled and formed into earthen bunds which partly define the site boundary. This soil will be available for site rehabilitation.

This parent material of the Broughillstown Complex consists of fluvio-glacial outwash and esker gravels of Weichsel Age, composed mainly of limestone with an admixture of mica-schist, granite and sandstone. In general, this outwash material is coarse and poorly sorted with inter-bedded lenses of better sorted material (GSI, 1998).

The 1:100,000 GSI bedrock geology Sheet 19: Geology of Carlow-Wexford (Tietzsch-Tyler and Sleeman, 1995) shows the subject site and surrounding area to be underlain by the Tullow Type 2 Sparsely Porphyritic Granite Formation. The Tullow Granites are described by the GSI as a late Silurian granite which was formed underground as molten igneous rock was forced upward before being slowly cooled beneath the remnants of older sea floor Ordovician sediments.

The granite is mostly of medium-grained texture but some coarse and fine veins cut the mass. Being composed of well-developed potash feldspar crystals, glassy quartz and black mica, it has a white background colour flecked with black. Along joints the granite is often deeply weathered to sand leaving solids blocks in between. The Tullow granite is intersected by a fault orientated along in a northwest – southeast plane, located approximately 700m northeast of the site.

Previous operations in the existing pit have targeted the local sands and gravels for extraction. Multiple exposures show this material to be of a minimum thickness of 7 m. No extraction has taken place below the water table. The pattern of excavation progressed westwards across the site.

The site is not within a geological heritage area. The nearest such designation is the Ballymoon Esker 15 km south-east of the site, close to Bagnelstown. This unit is described as a ridge of glacial sands and gravels which developed beneath and within melting ice sheets towards the end of the last glaciation period.

Three monitoring wells were installed on 19th-20th June 2018 in the plot to the north of the site as part of site investigation works. Bedrock was encountered at depths of between 12.25 m (MW1) and 13 mbgl (MW2). Bedrock was described as being soft weathered granite.

Extraction activities to date have resulted in the change in land use from crop production to resource extraction. The change in land use has not resulted in a significant loss of the previous land use (crop production) as the area the subject of this application is minor in comparison to the availability of land which is available for crop production. The proposed restoration plan will result in the application site being restored to agricultural land which will offset extraction activities to date.

The sand and gravel previously extracted was used as a raw aggregate for the construction and agricultural industries. This activity has had a beneficial impact to the local and regional economy in this regard. The necessity for such raw materials is recognised in the Carlow County Development Plan 2015-2021.

Historically there has been the potential for contamination of exposed subsoils as a result of spillages or leakages from stationary and mobile plant. Laboratory analysis of a downgradient shallow well has shown that groundwater quality at the site has not been adversely impacted by previous operations and as such contamination from previous activities is deemed to be undetectable. There are no designated sites with respect to geological features within the vicinity of the site.

Extractive operations were undertaken in accordance with “best practice” and appropriate guidelines for example EPA’s Environmental Management in the Extractive Industry guidelines and Irish Concrete Federation (ICF) Environmental Code.

8.0 Water

The site is underlain by a poor bedrock aquifer, consisting of bedrock which is generally unproductive except for local zones (PI). This type of aquifer is described as having limited groundwater potential whereby flow is generally restricted to the uppermost weathered bedrock zone. Much of the potential recharge to these strata is rejected and through flow is low. There is no primary permeability and limited fracture possibilities in these rock units, which restricts groundwater seepage and movement. Groundwater is likely to circulate predominantly through faults and fractures, or perhaps along the axes of anticlines.

The bedrock aquifer lies within the New Ross Groundwater Body (GSI, 2004) which is large and as such there is no site specific data relevant to the study area. The GSI have determined that the Burren Basin gravel deposits that overlie the bedrock unit are of sufficient magnitude to be classified as a locally important gravel aquifer (Lg). The Burren Valley Gravels may contribute to abstractions in the area and provide storage for the underlying aquifer, possibly helping to maintain yields during dry weather.

The GSI has assigned the existing site as having groundwater vulnerability classification of High (H), consistent with the broad valley area. There are no mapped groundwater source protection zones within an 18 km radius of the site. Potable water supplying the dwelling to the northeast of the extension area is abstracted from an on-site well. There are no drinking water supply wells downgradient of the site.

The site lies within the surface water catchment of the Roscat Stream, which flows in a southeast to northwest direction, passing the site 520 m to the southwest. The stream has a catchment of 5.9 km² as it passes adjacent to the site. The stream rises approximately 2 km southeast of the site in a topographical depression at Aghade. It outfalls to the Burren River just north of Rathtoe, which subsequently enters the River Barrow at Carlow Town.

Ardristan Fen, a proposed Natural Heritage Area (pNHA), as defined by National Parks and Wildlife Service occupies an area of 38 ha, most of which is due south of the application site, with the western portion of the fen extending from the Roscat Stream to the southwestern boundary of the site, at which point there is a slight overlap.

Historical mapping (OSI 6" and 25" maps) suggests that Ardristan Fen was formerly a more extensive area of seasonally saturated fen and marshland that developed within a topographical depression. The historical marsh extents in the 6" and 25" OSI maps correspond with the peat-based NPWS extents outlined in Figure 8.3.

It is important to note that in relatively recent times the area has undergone significant arterial drainage, presumably by local landowners. Reclamation of drained lands has been ongoing since 1975 and aerial photography shows the result of this as prevalence of improved grassland. The arterial drains intercept water table and transmit these waters in a general southwest direction toward the Roscat Stream. This is fairly typical in Ireland where undisturbed fens are very rare, with most having been drained and cultivated. Ardristan Fen is presumably fed by groundwater from the north.

The Slaney River SAC passes 1.4km to the northeast of the site. The river rises at the base of Lugnaquilla mountain (near Glendalough) and flows westwards towards Baltinglass, changing direction southward as it flows towards Tullow. Although relatively close to the site it is considered to be within a separate surface water catchment to the application site.

The River Barrow SAC is situated approximately 13 km west of the site. The Barrow rises in the Slieve Bloom mountains, County Laois and flows southwards to its confluence with the River Nore and River Suir at Waterford Harbour.

Groundwater levels surveyed in the application site and wider area demonstrate a relatively low range (61.84 – 63.40 mOD) suggesting a low hydraulic gradient, when compared with the steeper topographical gradients. There has been no pumped discharge of groundwater across the site boundary in the past. Hence historical activities shall have had no influence on groundwater levels or flow patterns in the area.

Water quality samples were recovered from a selection of trial pits and boreholes on site and sent to an accredited laboratory for analysis as part of the assessment. In summary, results indicate previous activities at the site have not had a detrimental impact on groundwater quality.

Historically, water was recycled from the final settlement pond to facilitate dust suppression. There are no historical records available to indicate former water usage rates at the quarry. However based on standard operations at similar sites this would not be expected to have exceeded 3 m³/d when required.

Impacts of historical activities on the hydrological and hydrogeological environment were assessed, and appropriate mitigation measures have been presented. In terms of flow and quality the groundwater regime in the area has been unimpeded by historical activities and there have been no impacts to groundwater flows through Ardristan Fen pNHA. Runoff from compacted areas of the pit floor and a hardstanding pad passes through a series of settlement ponds to remove suspended sediment prior to outfalling via gravity at the southern boundary.

Ardristan Fen has contracted significantly in the latter part of the last century due to arterial drainage, implemented to restore peats to productive grassland soils. Water quality in the fen appears to be affected by nutrient inputs from agriculture, through this was less pronounced during winter conditions. There were no nutrient sources in previous activities and these are assumed instead to come from local agriculture. Hence any impacts to the fen appear to have been from local agricultural practices rather than historical activities at the working pit.

9.0 Climate

The Irish climate is subject to strong maritime influences, the effects decreasing with increasing distance from the Atlantic coast. The climate of the study area is typical of the Irish climate, which is temperate maritime.

Quarrying activities undertaken at the application site including the stripping of overburden, extraction, processing and transportation of material to the existing pit would have potentially given rise to CO₂ and N₂O emissions associated with plant & vehicles operating at the site.

Although activity has now ceased at the application site, it is unlikely that activities undertaken would have led to a significant contribution of emissions to the environment due to the limited processes undertaken and the number of plant and machinery operating at the application site.

10.0 Air Quality

In order to assess the dust deposition flux at the land ownership boundary, and the PM10 and PM2.5 concentrations associated with the historical activities at sensitive locations beyond the land ownership boundary, air dispersion modelling was undertaken.

Modelling using the United States Environmental Protection Agency (USEPA) developed AERMOD air dispersion model was carried out as recommended by the USEPA. Dust generation rates were calculated from factors derived from empirical assessment and detailed in the USEPA database entitled "Compilation of Air Pollution Emission Factors", Volume 2, AP-42.

Dust is present naturally in the air from a number of sources including weathering of minerals, and pick-up across open land and dust generated from fires. Background levels of dust deposition and concentration of PM10 and PM2.5 have been determined and included in the dispersion modelling assessment.

A study by the UK ODPM (UK ODPM 1986) gives estimates of likely dust deposition levels in specific types of environments. In open country a level of 39 mg/(m²*day) is typical, rising to 59 mg/(m²*day) on the outskirts of town and peaking at 127 mg/(m²*day) for a purely industrial area. A level of 39 mg/m²*day can be estimated as the background dust deposition level for the region of the pit at Roscat, Co Carlow.

Emissions from the site lead to a dust deposition level averaged over the full year of 42 mg/(m²*day) at the land ownership boundary to the pit. Based on a worst case background dust deposition of 191 mg/(m²*day) in the region of the site, the combined dust deposition level peaks at 233mg/(m²*day) which is 67% of the TA Luft Limit Value of 350 mg/(m²*day). However, operational activities from the pit contributes a maximum of 12% of the TA-Luft Limit Value. The impact of dust deposition is considered slight adverse, localised and long-term.

Predicted PM10 concentrations are significantly lower than the ambient air quality standards at the worst-case residential receptor due to background concentrations and emissions from the site. For emissions from the pit the predicted 24-hour and annual concentrations (excluding background) at the worst-case receptor peak at 1.6 µg/m³ and 0.65 µg/m³ respectively. Based on a background PM10 concentration of 11 µg/m³ in the region of the site, the combined annual PM10 concentration including the site peaks at 11.65 µg/m³. This predicted level equates to at most 29% of the annual limit value of 40 µg/m³. The predicted 24-hour PM₁₀ concentration (including background) peaks at 17.65µg/m³ which is 35% of the 24-hour limit value of 50 µg/m³ (measured as a 90.4thile). Operational activities from the pit would have contributed a maximum

of 1.6% of the PM10 annual mean limit value. The impact of PM10 is considered negligible, localised and long-term.

Predicted PM2.5 concentrations at the worst-case receptor are significantly lower than the limit value of 25 $\mu\text{g}/\text{m}^3$ for the site. The predicted annual concentration (excluding background) at the worst-case receptor peaks at 0.21 $\mu\text{g}/\text{m}^3$. Based on a background PM_{2.5} concentration of 5.7 $\mu\text{g}/\text{m}^3$ in the region of the sand and gravel pit, the annual PM_{2.5} concentration including the operations peaks at 5.9 $\mu\text{g}/\text{m}^3$. This peak level equates to 24% of the annual limit value for PM2.5. Operational activities from the pit contribute a maximum of 0.84% of the PM_{2.5} annual mean limit value. The impact of PM_{2.5} is considered negligible, localised and long-term.

11.0 Noise & Vibration

A noise monitoring survey was carried out in order to assess the current/ baseline noise conditions at and around the site boundary and to assess the potential previous noise emissions from the historical works.

Plant and machinery which operated in the Substitute Consent area consisted of tracked excavators, wheel loaders, dump trucks and mobile processing plant. Ancillary plant such as a water bowser for dust suppression was deployed where required. Noise calculations were undertaken to assess the noise levels associated with the various plant and machinery which would have operated at the site at the nearest sensitive locations based on three scenarios

1. Scenario 1: Removal of overburden at the boundary of the site, at locations nearest to receptors.
2. Scenario 2: Extraction of sand and gravel in the middle of the site while assuming mobile processing being carried out in mid-site area.
3. Scenario 3: Extraction of sand and gravel while assuming mobile processing being carried out at extraction face of pit.

Noise levels were predicted at receptor locations based on the above scenarios with the associated plant and machinery operating at the pit. The calculated levels were below that recommended by the EPA Environmental Management Guidelines-Environmental Management in Extractive Industry (Non Scheduled Minerals). Therefore activity associated with the previous operation of the pit is unlikely to have impacted on noise levels at nearest sensitive receptors.

12.0 Traffic

The site is accessed from the N81 approximately 3 kms south of Tullow, followed by the L6026 westbound and then south towards the site access on an un-named local road. The most likely route for HGV trips to (and from) the existing development would be from the direction of Tullow on the N81, followed by a right turn at the existing priority junction with the L6026. This junction is a standard priority type junction with a right turn facility for vehicles turning right off the N81.

The junction has standard geometry with 3 x 3 m lanes on the N81 with the L6026 having a width of 6 metres. Visibility splays are clear at this junction.

The route then turns left off the L6026 at the priority junction with the un-named local road which is just over 5 metres wide. While visibility is clear to the east at this junction, visibility to the west, while sufficient to see approaching vehicles, would be significantly improved by trimming existing trees that overhang the carriageway edge.

During the operational phase of the existing development the impact of the additional development generated traffic on the N81 was slight, increasing traffic flows by a maximum of 2.1% during the AM peak hour and by 0.5% all day, in the year 2008.

On the L6026 leading to the site access, background traffic volumes were very low, and the impact of the additional traffic generated by the existing development would have been more noticeable. With a daily maximum 2-way flow of 50 pcus, equating to +28.2% during the AM peak hour, and +5.9% during the day, the impact on the L6026 and local road leading to the site was also slight.

From the assessment outlined in this section, it is concluded that the relatively low volumes of traffic that were generated by the existing development would have had a slight impact on the surrounding local highway network, which would have operated well within capacity up to the year 2008 when operations ceased.

13.0 Landscape & Restoration

The Landscape and Visual Impact assessment analyses the existing landscape character and significance, and provides an evaluation of the potential for landscape and visual impacts of the development. The historic sand and gravel extraction did not result in a significant increase in visibility of the pit. The increase in footprint area of the pit did not result in an increase in visual impact at the various viewpoints; therefore the magnitude of visual impact is assessed as 'Low'. The location and the configuration of the development ensure that the existing topography and vegetation screen its visibility from the surrounding area.

A Landscape and Restoration Plan is included as part of the application which involves returning the worked out pit to agricultural use.

14.0 Material Assets

Material assets comprise the physical resources in the environment, which may be of human or natural origin. The material assets that have been identified within the application site and in the surrounding landscape are listed below:

- Residential Buildings
- Geological Resource

- Land Resource
- Roads & Traffic
- Public Utilities
- Groundwater and Water Supplies
- Scenic Routes
- Tourism
- Archaeology
- Waste

The potential impacts on residences associated with extractive developments are in relation to landscape, noise, vibration, dust and traffic as a result of the day to day activities. The development of the pit has resulted in the loss of agricultural land. However, agricultural land is the dominant land resource in the area therefore it is not deemed to be a significant loss. The deposits, however, were used in the construction industry and this is considered an acceptable use of the resources.

15.0 Cultural Heritage

The archaeological and cultural heritage component of a remedial environmental impact assessment report of the development at Roscat, Co. Carlow consisting of a paper and fieldwork study was carried out. There are no items of cultural heritage, monuments or buildings of heritage interest known from the substitute consent area or vicinity. There are no direct or indirect impacts on any known items of cultural heritage, archaeology or buildings of heritage interest in the substitute consent area or the vicinity and no remedial measures are required.

16.0 Interactions

In examining the interactions of the impacts for the development one must investigate the combined physical, environment, visual and socio-economic impacts of the development on the receiving environment. Table 1 below illustrates the interaction of impacts assessed for the development.

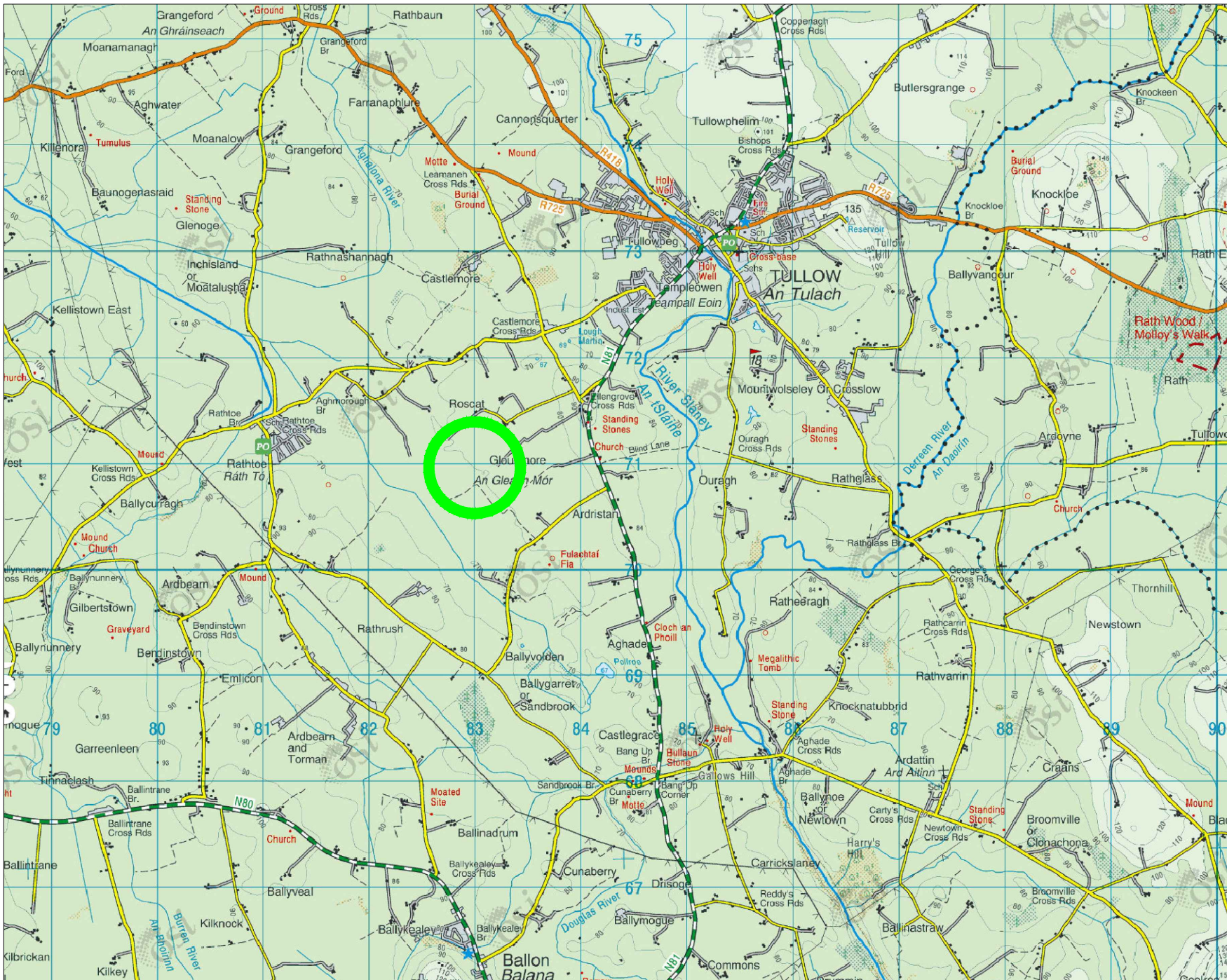
Table 1: Interactions Table

Factors	Pop. and Human Health	Biodiversity	Land, Soils and Geology	Water	Climate	Air	Noise and Vibration	Traffic	Landscape and Restoration	Material Assets	Cultural Heritage
Pop. and Human Health											
Biodiversity											
Land, Soils and Geology		x									
Water	x	x	x								
Climate	x										
Air	x	x		x	x						
Noise and Vibration	x	x									
Traffic	x					x	x				
Landscape and Restoration	x	x	x								
Material Assets	x		x				x	x	x		
Cultural Heritage											

17.0 Remedial Measures and Monitoring Summary

A summary of mitigation and monitoring measures have been compiled and will be implemented at the development.

Figures



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Legend

Site Location



ITM Coordinates: 683027 E, 670998 N

Rev	Description	Date

EARTH SCIENCE PARTNERSHIP

CONSULTING ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS
 Tonranny Westport Co. Mayo
 tel: +353(0)98 28999 fax: +353(0)98 24727
 e-mail: earthsciencepartnership@gmail.com
 Ordnance Survey Ireland Copyright Licence No.: EN 0021419

Client: Kilcarrig Quarries Ltd.

Project: Non Technical Summary to Accompany a Substitute Consent Application for a Sand & Gravel Pit Located at Roscat, Tullow, Co. Carlow

Title: Site Location Map

Drawn By: Sean O' Donnell

Checked By: Patrick O' Donnell

Scale: 1:50,000 @ A4 Date: Apr. 2019

Job No: EI 061 Rev: 0


NTS Fig 1

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Legend

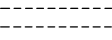
Ownership Boundary

Application Area
Area = 4.7 Ha

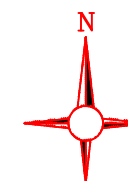
Aggregate Stockpile 

Water 

Vegetation 

Access Road/Track 

Tree Cover 



All Levels Relative to Ordnance Datum

O.S. Map Ref No. 4475 - B

ITM Coordinates: 683027 E, 670998 N

EARTH SCIENCE PARTNERSHIP

CONSULTING ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS
Tonranny Westport Co. Mayo
tel.: +353(0)98 28999 fax: +353(0)98 24727
e-mail: earthsciencepartnership@gmail.com
Ordnance Survey Ireland Copyright Licence No.: EN 0021419

Client: Kilcarrig Quarries Ltd.

Project: Non Technical Summary to Accompany a Substitute Consent Application for a Sand & Gravel Pit Located at Roscat, Tullow, Co. Carlow

Title: Existing Site Layout Map

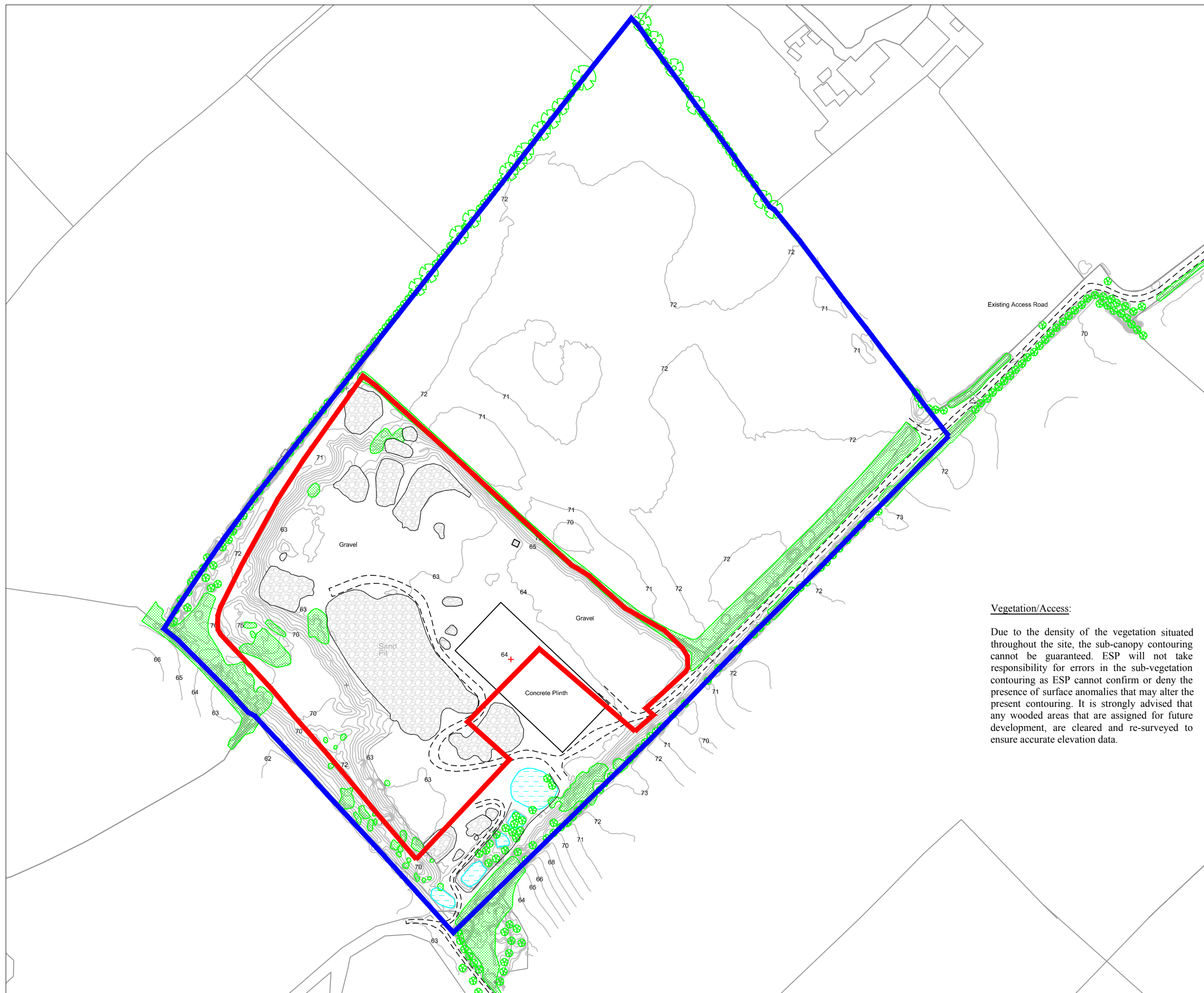
Drawn By: Sean O' Donnell

Checked By: Patrick O' Donnell

Scale: 1 : 2,500 @ A3 Date: Apr. 2019

Job No: EI061 Rev: 0

NTS Fig 2



Vegetation/Access:

Due to the density of the vegetation situated throughout the site, the sub-canopy contouring cannot be guaranteed. ESP will not take responsibility for errors in the sub-vegetation contouring as ESP cannot confirm or deny the presence of surface anomalies that may alter the present contouring. It is strongly advised that any wooded areas that are assigned for future development, are cleared and re-surveyed to ensure accurate elevation data.

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Legend

Ownership Boundary

Application Area

Area = 4.7 Ha

Spot Level + 63.5

Aggregate Stockpile

Water

Vegetation

Access Road/Track

Tree Cover

All Levels Relative to Ordnance Datum

O.S. Map Ref No. 4475 - B

ITM Coordinates: 683027 E, 670998 N

EARTH SCIENCE PARTNERSHIP
CONSULTING ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

Tonranny Westport Co. Mayo
tel.: +353(0)98 28999 fax: +353(0)98 24727
e-mail: earthsciencepartnership@gmail.com
Ordnance Survey Ireland Copyright Licence No.: EN 0021419

Client: Kilcarrig Quarries Ltd.

Project: Non Technical Summary to Accompany a Substitute Consent Application for a Sand & Gravel Pit Located at Roscat, Tullow, Co. Carlow

Title: Proposed Final Restoration Layout

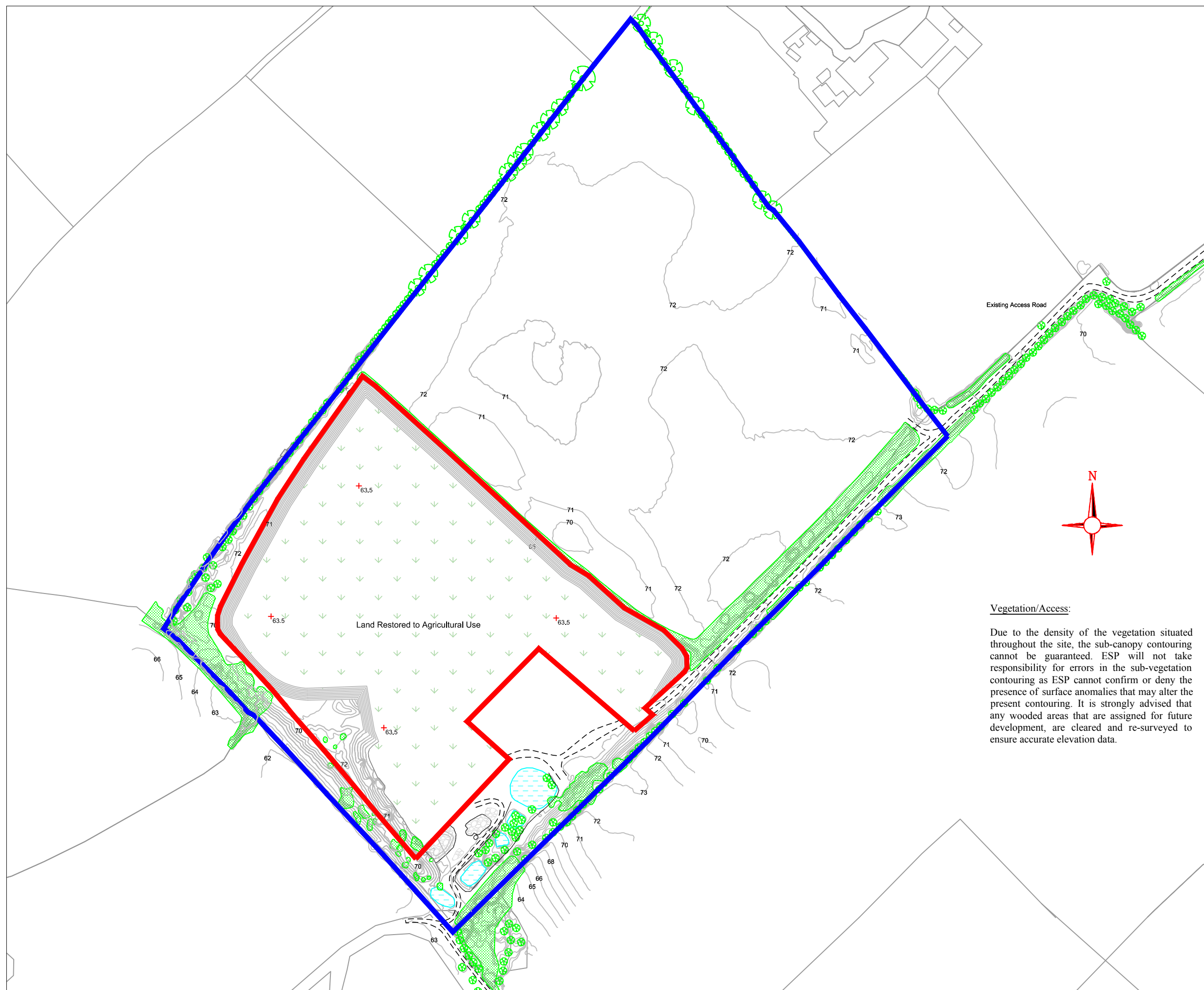
Drawn By: Sean O' Donnell

Checked By: Patrick O' Donnell

Scale: 1 : 2,500 @ A3 Date: Apr. 2019

Job No: EI061 Rev: 0

NTS Fig 3



Vegetation/Access:

Due to the density of the vegetation situated throughout the site, the sub-canopy contouring cannot be guaranteed. ESP will not take responsibility for errors in the sub-vegetation contouring as ESP cannot confirm or deny the presence of surface anomalies that may alter the present contouring. It is strongly advised that any wooded areas that are assigned for future development, are cleared and re-surveyed to ensure accurate elevation data.