

# JSPE

J Sheils Planning & Environmental Ltd

## N&C Enterprises Ltd.

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the Pit, Kilmeage,  
Naas, Co. Kildare.

4th September 2003

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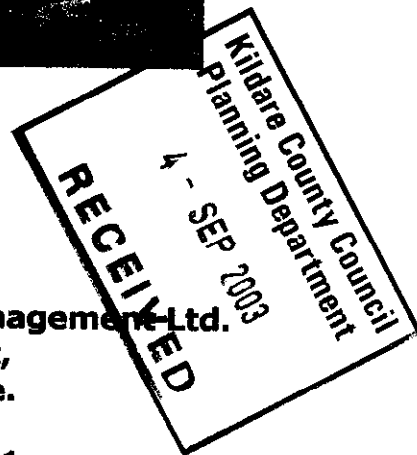
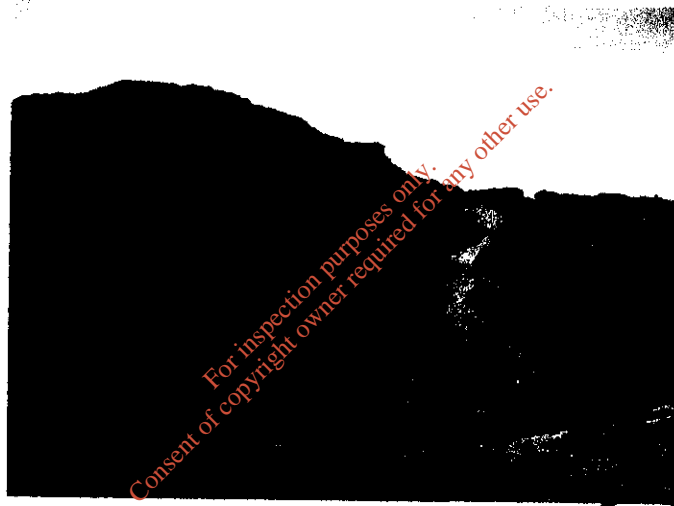
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ENVIRONMENTAL IMPACT STATEMENT

**N&C Enterprises Ltd.,  
Blackhill,  
Kill,  
Co. Kildare**

**ENVIRONMENTAL IMPACT STATEMENT**



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**4 September 2003**

**ENVIRONMENTAL IMPACT STATEMENT**  
**PROPOSED RESTORATION OF 'THE PIT',**  
**KILMEAGE, CO. KILDARE**

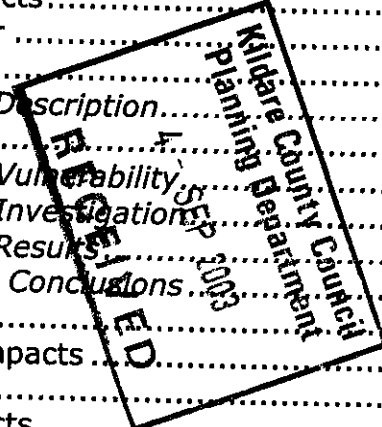
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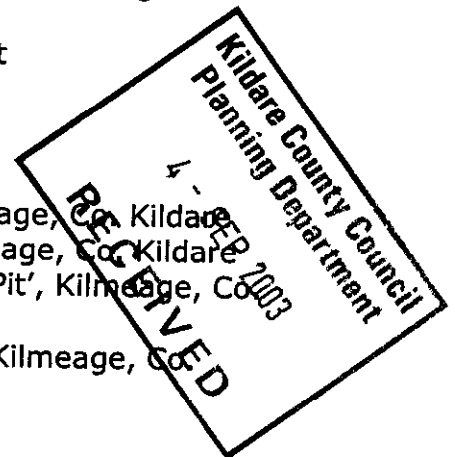
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## **1. INTRODUCTION**

### **1.1 Master Plan for the Company's Landholdings**

N&C Enterprises Ltd. (N&C) operates a sand and gravel extraction and processing business at 'The Pit', Kilmeage, Co. Kildare. The location of the Kilmeage Pit is shown on Figure 1 (See Appendix 1). The lands have been used for sand and gravel extraction for greater than 60 years. These lands comprise deep excavations with steep walls.

The current site area under the ownership of N&C is estimated at 6.5 hectares in total, and is depicted on Figure 2. As the life of the pit is nearing completion, N&C propose to restore the lands to form a rounded hill that would tie into the ground levels of the surrounding lands.

The current Master Plan for the landholding is to backfill the pit with inert materials imported onto the site. Following completion of the backfill operations, the site would be returned to agricultural use and/or utilised for further development for the local community, subject to a planning permission.

### **1.2 Pre-Planning Submissions**

Following correspondence with Kildare County Council Planning Department, a pre-planning report was submitted to Kildare County Council on 24 April 2003 outlining a full description of the nature and extent of the development being proposed by N&C at the Kilmeage site.

Upon receipt of this pre-planning submission, Kildare County Council (Ms. Emer Doyle) held a meeting with N&C and Environment & Resource Management Ltd. (ERML). During this meeting Kildare County Council (KCC) outlined the requirements of a planning application for this type of development. KCC also advised that environmental baseline and potential impact submissions concerning the proposed development should be prepared.

### **1.3 Overview of Restoration Plan**

The site requires restoration work as it represents in its current state both a possible health and safety hazard, and a scar in the landscape immediately adjacent to the centre of the village of Kilmeage. N&C propose to backfill the void with imported inert materials, sourced from various locations and will include existing clients of N&C.

The restoration plan includes:

- Providing landscaping and a paved access
- Backfilling the site with imported inert materials, and



- Reinstating the ground levels to tie into the surrounding lands and producing a rounded hill that would be similar to the land that existed prior to the aggregate extraction operations.

#### **1.4 Waste Permit Application**

As there are insufficient materials on site to restore the lands to former ground levels, materials must be imported. Some of the imported materials by definition will be wastes as they arrive at the site. However these materials will be used for site restoration, and are to include soils, stones, bricks and concrete.

In order to comply the Waste Management (Permit) Regulations 1998, the facility that will be developed at Kilmeage will require a Waste Permit. Under the First Schedule, activities subject to waste permitting include the recovery of wastes at a facility.

Accordingly, N&C have submitted a Waste Permit application to KCC Environment Section on 9 April 2003. Following receipt of this application, KCC issued a request for additional information on 9 May 2003, which was responded to on 16 July 2003.

##### **1.4.1 Source of Materials**

Materials to fill the void will come mainly from existing clients of N&C, who operate mainly in the building trade. It is envisaged that collection of the materials will be fully managed by N&C's existing transport fleet, and Waste Collection Permits from those areas where materials will be collected will be sought. It should be noted that N&C have already received waste collection permits for the following jurisdictions:

- Dublin City Council
- South Dublin County Council
- Fingal County Council
- Dun Laoghaire/Rathdown County Council

The facility will not be open for use by the general public carrying waste in cars, trucks, small vans etc.

Access to the site will be via the Prosperous to Kilmeage road (Road L7081-1). The number of loads into the site, in relation to this development, will be 46 per day on average over a period of ca. 6 years. The number of loads will naturally fluctuate from day to day and month to month over the years. The predicted traffic movements are addressed in Section 3.6. The lorries will travel predominantly from the southwest direction (M7/Allen Road) and from the northeast direction (Prosperous), as is the case at the moment for traffic associated with the pit.

The total truck movements into the site will include the loads of materials for restoration and the movements associated with ongoing activities at the site.

The site will be operated and monitored in accordance with the Waste Permit, which will be issued by Kildare County Council.

Based on an average projected filling rate of 46 loads per day, it is estimated that the void would be filled within a 6-year time frame based on filling this void with inert materials. The 6-year time span would be shortened proportionally by increasing the intake rate. For example an average of 56 loads per day would reduce the filling time to 5 years. The final grading and seeding work will take additional time and will stretch the project to perhaps 8 years from start of filling.

Environmental monitoring will be carried out as long as may be required by the Waste Permit.

### 1.5 The Applicants

N&C Enterprises Ltd. (Company No. 242643) has been trading since 1995, and is a family owned and operated company. It is primarily engaged in the supply and delivery of sand and gravel products to the building and construction industry. The Company's activities are mainly geared towards supplying local demand and the Dublin market.

Current employment in the company is 10 full time and two part time persons.

### 1.6 Need

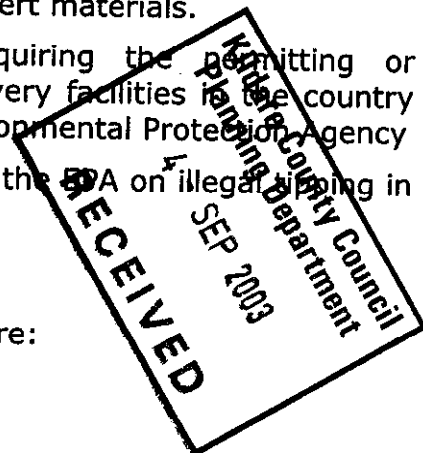
There is a need for this type of development. This has arisen and exists because of a number of factors including:

- The economic boom in the country over the last decade has resulted in increases in population in urban areas, which has resulted in an increase in all waste streams including inert materials.
- Tougher environmental legislation requiring the permitting or licensing of all waste disposal and recovery facilities in the country by either the Local Authority or the Environmental Protection Agency
- The clamp down by local authorities and the EPA on illegal tipping in the country.

### 1.7 Alternatives

The alternatives considered by the company were:

1. Leave site in its present state
2. Restore the site with inert materials



### **Alternative 1:**

It is not feasible to leave the site in its present state, as it constitutes a hazard from a health and safety perspective. Coupled with this, the character and quality of the village of Kilmeage will remain affected if the pit was to be left in its current state, thus not encouraging environmental enhancement of the village and its environs.

### **Alternative 2:**

The acceptance of inert materials to restore the site is the best option in terms of meeting the requirements of the current Kildare County Development Plan (1999-2004). This will ensure that the character and quality of the village of Kilmeage will be retained, with a net environmental enhancement of the site and its environs.

There is an obvious and well-documented need for well-management waste management facilities in Ireland. The September 1998 Policy Statement on waste by the Department of Environment confirms the need.

## **1.8 Structure of the EIS**

This EIS has been written to satisfy Schedule 6 of S.I. No. 600 of 2001, and where appropriate in accordance with the Environmental Protection Agency publication entitled "Guidelines on the Information to be Contained in an Environmental Impact Statements" (March 2002).

This EIS is subdivided as follows:

- Section 1** Introduction
- Section 2** The Proposed Facility
- Section 3** The Receiving Environment, Mitigation Measures and Likely Significant Effects
- Section 4** Environmental Monitoring
- Section 5** Compliance with Requirements of Schedule 6 (S.I. No. 600 of 2001)

## **1.9 Contributors To The EIS**

This EIS was prepared by a number of consulting firms. The members of the study team and their respective inputs are as follows:

Consultant	Address	Responsibility
Environment & Resource Management Ltd.	3 Tara Court, Naas, Co. Kildare	<ul style="list-style-type: none"> <li>• Master Plan</li> <li>• Proposed Facility</li> <li>• Air</li> <li>• Climate</li> <li>• Flora and Fauna</li> <li>• Human Beings</li> <li>• Soils, Geology and Groundwater</li> <li>• Landscape</li> <li>• Noise</li> <li>• Surface Water</li> <li>• Material Assets</li> <li>• Interactions</li> </ul>
Cultural Resource Development Services Ltd.	Campus Innovation Centre Roebuck UCD Dublin 24	<ul style="list-style-type: none"> <li>• Cultural Heritage</li> </ul>
Traffic Wise Ltd.	Bracetown Business Park Clonee Co. Dublin	<ul style="list-style-type: none"> <li>• Traffic (for Human Beings section)</li> </ul>

### 1.10 Data Necessary to Identify and Assess Environmental Effects of the Development

The data necessary to identify and assess the environmental effects of the development are:

- The characteristics of the development including its physical dimensions, volumes, rates of intake, nature of materials being accepted, and the appearance and condition of the facility as described in Section 2
- The existing/receiving environment, emissions and mitigation measures as described in Section 3
- The proposed monitoring plan as described in Section 4

### 1.11 Forecasting Methods Used to Assess any Effects on the Environment

Professional judgment based on site reconnaissance and investigations, desktop studies and calculations were used to assess effects on the environment.

### 1.12 Difficulties In Compiling Specified Information

Much of the specified information was obtained through in-house and commissioned surveys. No great difficulties were encountered in compiling information.

## **2. THE PROPOSED FACILITY**

### **2.1 The Application Site**

The application site comprises a largely redundant sand and gravel pit. At present there are some extraction and processing activities being carried out. However, the pit is nearing exhaustion.

Sand and gravel extraction and processing operations have been undertaken at the Kilmeage site from the 1940s to the present.

The application site is ca. 6.5 ha in size and is depicted on Figures 1 and 2 (see Appendix 1).

### **2.2 The Proposed Development**

The Applicant proposes the following works:

- Paving the site access road with macadam surface
- Planting and landscaping sections of the site boundary
- Importing inert materials from sources such as Builders'/Construction and Demolition (C&D) wastes over a ca. 6 year period
- Placing, levelling and compacting imported materials
- Grading and seeding completed areas of the site on a phased basis over an 8 year period

Subject to granting of planning permission for the development described above, works temporarily required in connection with this development will be constructed or placed on the site from time to time. These temporary works will include haul roads, hardstands and hardstands in the pit, a portacabin and a wheelwash. Due to the nature of project these works must be temporary, will be moved around the site and will be removed upon completion of the proposed development.

### **2.3 Waste Types and Quantities**

#### **2.3.1 Quantities**

The estimated volume of material required to fill the existing pit from the contours shown on Figure 3 to the conceptual landform is 950,000 m<sup>3</sup>. This volume corresponds to some 1.5 million tonnes of heavy construction and demolition wastes such as soil, stones, broken concrete, tiles, and macadam (assuming an average density of 1.6 t/m<sup>3</sup>).

### 2.3.2 Nature of Materials

The wastes that would be used for restoration of the site, in terms of European Waste Catalogue classes are indicated in Table 2.3.1.

**Table 2.3.1: European Waste Classes of Materials Proposed (P) to be accepted at the Facility**

Major Headings	Waste Class	Description	Proposed
<b>17 00 00</b>		<b>Construction and demolition waste (including road construction)</b>	
	<b>17 01</b>	<b>Concrete, bricks, tiles, ceramics, and gypsum based materials</b>	
	17 01 01	Concrete	P
	17 01 02	Bricks	P
	17 01 03	Tiles and Ceramics	P
	17 01 07	Mixture of concrete, bricks, tiles and ceramics	P
	<b>17 02 00</b>	<b>Wood, Glass and Plastic</b>	
	17 02 02	Glass	P
	<b>17 03 00</b>	<b>Asphalt, tar and tarred products</b>	
	17 03 02	Bituminous mixtures	P
	<b>17 05 00</b>	<b>Soil and dredging spoil</b>	
	17 05 04	Soil and stones	P
	17 05 06	Dredging spoil	P
	<b>17 09</b>	<b>Other construction and demolition waste</b>	
	17 09 04	Mixed construction and demolition	P

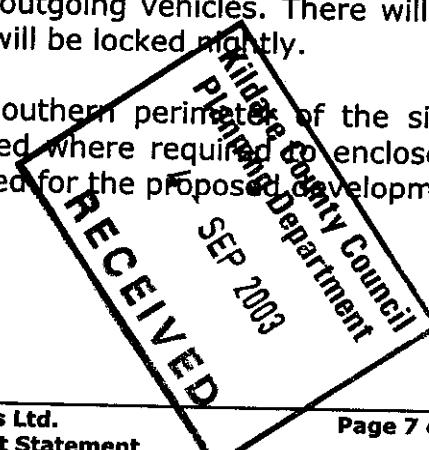
### 2.4 Proposed Site Infrastructure

It is envisaged that the restoration of the pit will be undertaken in the short term (i.e. 5 to 6 years), and as such only temporary infrastructure will be required. This infrastructure will be removed immediately following the restoration of the pit.

#### 2.4.1 Site Security

A temporary portacabin office will be included for security purposes and to facilitate the recording of incoming and outgoing vehicles. There will be a main gate at the entrance to the site. It will be locked nightly.

There is a boundary fence along the southern perimeter of the site at present, which will be extended/enhanced where required to enclose the entire site if planning permission is granted for the proposed development.



#### **2.4.2 Site Access Road**

The site will be accessed via an existing entrance off of the Prosperous to Kilmeage road. The private access road will be surfaced with macadam. Temporary haul roads will be developed within the pit for access to restoration areas in the pit.

#### **2.4.3 Temporary Wheel wash**

A temporary wheel wash may be installed in the pit or on a temporary haul road. This will not be a substantive structure and will only be installed as and when required.

#### **2.4.4 Fuel Storage Areas**

Fuel for plant and machinery will be stored in mobile double bunded tanks located in the pit.

#### **2.4.5 Waste Inspection Areas**

Wastes will be inspected after the load is tipped on the ground.

#### **2.4.6 Waste Quarantine Areas**

There will be a waste quarantine area provided, which will be used to quarantine wastes that are considered inappropriate, and will be moved off-site for appropriate disposal. The quarantine area will be hardstand comprising hardcore. By necessity it will be moved around the pit as areas are restored.

#### **2.4.7 Services**

The site will be serviced with electricity, telephone/fax lines. A potable water supply will be provided by water dispenser/bottled source. A drilled well is proposed to provide a water supply for dust suppression. Underground ducts will be utilised to carry cabling from the main road to the site.

#### **2.4.8 Foul Sewage**

There will be temporary portaloos on-site for employees. These toilet units will drain to a fully contained underground tank, which will be emptied on a regular basis depending on the requirement.

#### **2.4.9 Surface Water Drainage**

All paved surfaces at the site will drain to roadside french drains and soak holes.



## **2.5 Facility Operations**

### **2.5.1 Operating Times**

The facility will accept materials from Monday to Saturday 7.00 am to 18.00 pm. The facility will be closed on Sundays and Bank Holidays.

### **2.5.2 Personnel**

There will be approximately 4 operatives and a site manager employed directly to operate and manage the facility. Consultants will be retained to undertake environmental monitoring, as required.

### **2.5.3 Waste Acceptance Procedures**

As outlined in the Waste Permit Application No. 126/2003 (Additional Information Response July 2003), N&C intend to collect inert wastes from an appropriate catchment area in proximity of the site. This catchment could include Dublin and Kildare as major sources. However, other counties may also include Meath and Wicklow, depending on market forces.

All material will be inert in nature. To ensure that inert material only is collected, a rigorous waste acceptance procedure will be put in place prior to the acceptance of any wastes.

Basic characterisation is the main step in the waste acceptance procedure for the Kilmeage facility, and constitutes a full characterisation of the waste prior to collection by gathering all necessary information to ensure the material is inert.

As the permit application is for inert wastes only, the guiding principal behind this acceptance procedure is to ensure that inert material only arrives at the site. Therefore, characterisation will be carried out prior to removal of the waste from its source.

It is the intention of the permit holder to require the waste producer/contractor to complete a basic characterisation of the waste prior to the removal from the site at which the waste is produced. This will require the filling out of a 'Waste Acceptance Control' Forms.

Once filled out and forwarded to the Kilmeage facility, the facility manager will send a Customer Service Agreement (i.e. a contract) to the client for signing. Once signed, N&C will dispatch a vehicle(s) to collect the waste material. The driver of the vehicle(s) will visually assess the material prior to removing it from source, and would reserve the right to refuse the material if it was deemed unsuitable. If a third party delivers material to the site, a signed copy of a Customer Service Agreement will be required before the load is accepted. All loads arriving at the site will be visually assessed.

If material arrives at the Kilmeage facility is deemed to be unsuitable by the facility manager, this waste will be diverted to the waste quarantine area. Once in quarantine, the waste material will either be returned to its source or tested to determine whether it is inert or contaminated.

#### **2.5.4 Plant and Equipment**

Plant related to the development will include:

- Excavator
- Bull dozer (Front loader)
- Farm tractor and bowser
- Road sweeper attachment
- Haulage trucks

#### **2.5.5 Waste Handling**

Operations will be similar to the following:

- Waste deposited on the ground
- Inspection of waste on the ground
- If waste is found to be in contravention of acceptable wastes as dictated in the Waste Permit, it will be re-loaded on the originating lorry and removed from the site

### **2.6 Environmental Nuisance Controls**

#### **2.6.1 Dust Control**

Use of macadam surfaces at the entrance to the site will significantly reduce the formation of dust (see Figure 4). Road cleansing and provision of a temporary wheel wash if required will ensure that mud and dust are controlled. Water will be sprayed onto the road and on other bare waste surfaces using a bowser as required. A power sweeper attachment for a tractor or JCB will be available on site as well. All operations on site will be carried out in a way that will ensure that no dust nuisance occurs beyond site boundaries.

#### **2.6.2 Fire Control**

Measures for fire prevention and control will include:

- Emergency response contact numbers will be posted in prominent positions on site (fire service, police, ambulance and other agencies).
- A telephone system on site will ensure instant contact with the emergency services.

- A water supply will be available from an on-site groundwater well.
- Fire hoses and extinguishers will be available on site.
- No burning of waste will be permitted on site.
- There will be no unauthorised people allowed access to the site.

### **2.6.3 Road Cleansing**

Road cleansing and sweeping will be carried out as required.

### **2.6.4 Vermin Control**

It is anticipated that vermin will not be an issue at this site as the waste will be inert in nature.

## **2.7 Restoration and Aftercare**

### **2.7.1 Restoration Plan**

It is planned to restore the pit on a phased basis as outlined in Figure 5, which shows the restoration process over 4 phases. Following the completion of backfilling activities, the proposal is to restore the site for agricultural uses. Subject to obtaining a further planning permission, other uses such as amenity or other development consistent with proper planning and development of the site will be considered by the Applicant.

### **2.7.2 Proposed Contours**

The plan is to backfill the reformed pit to the indicative landform as presented on Figure 6. It can be readily seen that the eventual contours tie in with the existing levels of the lands in the vicinity. The highest level of the reshaped site will be 132 mOD after consolidation and settlement of the wastes.

### **2.7.3 Restoration Layers**

The uppermost layer on the restored site will be topsoil approximately 150 mm. The topsoil will be placed and grass will be sown on a phased basis across the site. Below the topsoil there will be a layer of subsoil 850 mm thick.

Surface runoff from the completed surface will be controlled as required by a system of open and French drains installed along the edge of the completed landform to adjoining field drains.

### **2.7.4 Landscaping Plan**

An outline landscaping plan is included in Section 3.8.

## **2.8 Use of Natural Resources**

As the current pit area is nearing exhaustion, the extraction of natural resources from the pit will cease over time. In terms of the proposed development, the use of natural resources will include fossil fuels for plant, machinery and truck movements, and the abstraction of groundwater from an on-site well for dust suppression.

Due to the small nature of the proposed development, the impact of the use of these natural resources is considered insignificant and thus is not considered any further in this EIS. However, all efforts will be made to ensure that the most efficient methods will be applied to avoid the unnecessary use of hydrocarbon fuels at the site and during collections/delivery's, and water use will be kept to a minimum.

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### **3. ENVIRONMENTAL ASSESSMENT**

This section is broken into a number of subsections (e.g. Air). Each subsection typically consists of subsections. They are Existing Environment; Potential Emissions; Likely Impacts; Mitigation Measures; and Likely Significant Impacts.

"Existing Environment" examines the environment as it pertains to a particular parameter (e.g. groundwater). It should be noted the "Potential Emissions" takes a broader than traditional view of emissions (e.g. dust, noise etc) to include any change to the environment as a result of the proposed development (e.g. loss of habitat, generation of traffic etc). The "Likely Impacts" section reviews the likelihood of the "Potential Emissions" leading to a negative environmental impact if no "Mitigation Measures" were taken. "Mitigation Measures" have been developed to ensure that there are no "Likely Significant Impacts".

#### **3.1 Air**

##### **3.1.1 Existing Environment**

The site is situated immediately northeast of Kilmeage village, which is situated approximately 12 km west of Naas. The main area of existing residential development is to the south and west of the site.

The main sources of emissions to air from the proposed activities are likely to be dust from the movement of material related to the restoration of the sand and gravel pit. A measurement frequently used in connection with air quality assessments where dust emissions may be significant is Dust Deposition Rate, which is normally measured by gravimetrically determining the mass of particulate matter and dust deposited over a specified surface area over a period of one month (28 days). The results are expressed as dust deposition rate in mass per unit area per day.

Typical dust deposition rates in a rural agricultural environment are low; typically in the range 0 - 60 mg/m<sup>2</sup>-day, with values of up to 80 - 120 mg/m<sup>2</sup>-day in urban locations. The spatial pattern of dust deposition may be influenced by local wind direction and strength. The pattern of wind direction and strength is described in Section 3.2. The prevailing wind direction is from the southwest, which would tend to blow any dust to the northeast of the site. Rainfall will also tend to reduce the rate of emission of dust.

In order to determine the impact of the existing activities upon the air quality, a survey of dust deposition rates at selected locations around the site was undertaken.

Dust monitoring at 'The Pit' was undertaken between 12 June and 9 July 2003 (28 days), and was undertaken in accordance with the German

Standard "VDI 2119 (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument – German Institute".

The dust deposition gauges were positioned at locations near to the site boundary as indicated on Figure 3 to establish the baseline dust conditions at present. Results from the dust survey are included in Table 3.1.1 below. Further details on these dust results are included in Appendix 2 of this EIS.

**Table 3.1.1: Baseline Dust Deposition Survey, Kilmeage, Co. Kildare. (Completed June/July 2003)**

Monitoring Location	Dust Deposition Rate (12 June to 9 July 2003) (mg/m <sup>2</sup> /day)
D1 Entrance to Site	155
D2 Adjoining existing haul road	390
D3 Northern site boundary	247
D4 Eastern site boundary	1952
D5 South-eastern site boundary	57
D6 Southern site boundary	40

Dust deposition rates across the site ranged from 40 mg/m<sup>2</sup>/day to 390 mg/m<sup>2</sup>/day. The result from D4 (1952 mg/m<sup>2</sup>/day) is regarded as spurious as stones and other grit material was identified in the sample, probably deposited by birds occupying the adjoining tree-lined hedgerow.

The results of the dust deposition survey suggest that the existing environment displays slightly elevated levels for dust deposition. It should be noted that a standard of 350 mg/m<sup>2</sup>/day is a normal Emission Limit Value for waste management facilities licensed by the Environmental Protection Agency (EPA).

Dust monitoring locations D2 slightly exceeded this value, however D2 (390 mg/m<sup>2</sup>/day) is located within the pit area adjoining the haul road, which is likely to show increased levels for dust deposition due to traffic activity on the unpaved surface.

The value measured at D3 was slightly elevated. This monitoring location was situated towards the north of the site and away from residential areas. It should also be noted that as the dominant wind direction is from the south/south-west/west direction (see Climate Section 3.2), any dust

generated from existing activities is likely to travel in a northerly direction, as is indicated in the dust sample D3 (247 mg/m<sup>2</sup>/day).

### **3.1.2 Potential Emissions**

The proposed development will comprise of backfilling the void space at Kilmeage with ca. 1.5 million tonnes of inert materials. It will be filled over a period of approximately six years.

As outlined in the Traffic Section of this EIS, there will be no additional traffic volumes resulting from this proposal. Therefore dust levels should remain similar to the existing levels. However, during periods of dry weather additional dust may be generated depending on the type of material being imported for restoration.

### **3.1.3 Description of Likely Impacts**

The operational phase is likely to produce emissions of dust. However, the site and associated vegetation should be sufficient to reduce any impacts of dust deposition upon sensitive receptors.

### **3.1.4 Mitigation Measures**

Mitigation measures will be put in place as required to avoid nuisance to surrounding residences. These will include the following where necessary:

- retention and enhancement of existing vegetation at the site perimeter
- use of dust suppression measures including temporary wheelwash facilities to prevent material being transferred to external roads during operations at the site
- use of a bowser to distribute water on haul roads

In the long term the development will result in reduced potential for emissions of dust because the site will be restored and revegetated.

### **3.1.5 Likely Significant Impacts**

It is predicted that there will be no significant impacts upon air quality caused by the operation of the proposed development. In fact the proposed development (i.e. restoration of the pit) will have a net positive impact by replacing the existing area of bare exposed soil with vegetated surfaces.

All of the likely impacts that have been identified have been addressed and mitigation measures proposed where necessary to ensure that the impacts remain at acceptable levels.



## **3.2 Climate**

### **3.2.1 Existing Environment**

The site of the proposed development is situated in Kilmeage, Co Kildare, approximately 12 km west of Naas.

The Irish climate is subject to strong maritime influences, the effects decreasing with increasing distance from the Atlantic coast. Since no area of the country lies more than 120 km from the sea, the range of mean temperatures across the country is narrow. Data from Met Éireann, the Irish meteorological service, who operate monitoring stations at a number of locations around the country, indicates that December, January and February are generally the coldest months of the year. Most areas of the eastern half of the country (which includes the location of the proposed site) experience rainfall in the region of 750-1100 mm per annum.

There is no continuous meteorological monitoring station located uniquely close to the site of the proposed development. However, comprehensive meteorological data is available for Casement Aerodrome, which is approximately 25 km northeast of Kilmeage.

Analysis of the monitoring data from the meteorological station at Casement Aerodrome from 1992-1996 shows that the dominant wind direction is from the S-SW-W quadrant with an annual incidence of about 55%. The annual average wind speed is approximately 5.5m/s with wind speeds of < 3 m/s occurring for 30 % of the year; wind speeds in excess of 5 m/s occur for 45 % of the year. Wind speed and direction can affect the pattern and extent of dispersal of pollutants emitted by the proposed development.

An analysis of mean monthly temperatures and precipitation rates for Casement Aerodrome is presented in Table 3.2.1. Mean monthly temperatures for the area are in the range 5.0 to 15.3°C, with mean monthly precipitation rates in the range 49.6mm in June to 80.6 mm in January. The average annual precipitation rate at Casement is 756.9mm.

### **3.2.2 Potential Emissions**

Air emissions are dealt with in Section 3.1 (Air).

### **3.2.3 Description of Likely Impacts**

Likely impacts from air emissions are dealt with in Section 3.1 (Air).

### **3.2.4 Mitigation Measures**

Mitigation measures to avoid impacts from air emissions are dealt with in Section 3.1 (Air).

**Table 3.2.1: Climate Data for Casement Aerodrome (1992-1996)**

Month	Mean Temp. °C	Mean Rainfall (mm)	Potential Evapo-transpiration (mm)	Effective Rainfall (mm) <sup>1</sup>
January	5.5	80.6	9.9	70.7
February	5.4	62.1	19.2	42.9
March	6.3	59.1	36.0	23.1
April	8.2	57.9	56.3	1.6
May	10.0	68.2	77.0	-8.8
June	13.6	49.6	93.0	-43.4
July	15.3	56.2	86.1	-29.9
August	14.7	54.0	77.1	-23.1
September	12.1	54.5	46.2	8.3
October	9.6	61.0	23.7	37.3
November	7.3	76.1	7.2	68.9
December	5.0	77.6	4.4	73.2
Monthly Average	9.4	63.1	44.7	18.4
Annual Total	-	756.9	536.7	220.2

Note 1: Effective rainfall = Mean rainfall - Potential evapo-transpiration

### 3.2.5 Likely Significant Impacts

See Section 3.1 (Air).

### 3.3 Cultural and Archaeological Heritage

The following section was prepared by Cultural Resource Development Services Ltd.

#### 3.3.1 Existing Environment

For the purpose of setting the proposed development within its wider archaeological and cultural heritage landscape, and to assess the archaeological potential of the site, a comprehensive desktop survey of all available archaeological, historical and cartographic sources was undertaken.

##### 3.3.1.1 Recorded archaeological sites and monuments

The Record of Historic Sites and Monuments were consulted for the relevant parts of Co. Kildare. This is a list of archaeological sites known to the National Monuments Service. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, OPW Archaeological Survey notes and other relevant publications. These were studied in the Sites and Monuments Records Office. All sites within a radius of c. 1km of the proposed development were identified, as depicted on Figure 7. There are a total of six sites

recorded. These monuments are listed in the Archaeology Report (See Appendix 3).

### **3.3.1.2 Recorded archaeological finds**

The topographical files in the National Museum of Ireland were consulted to determine if any archaeological artefacts had been recorded from the area. This is the National archive of all known finds recorded by the National Museum. It relates primarily to artefacts but also includes references to monuments and has a unique archive of records of previous excavations. Other published catalogues of prehistoric material were also studied: Raftery (1983 - Iron Age antiquities), Eogan (1965; 1993; 1994 - bronze swords, Bronze Age hoards and goldwork), Harbison (1968; 1969a; 1969b - bronze axes, halberds and daggers) and the Irish Stone Axe Project Database (Archaeology Dept., U.C.D.). All townlands within the study area were assessed. There is a total of six finds recorded. A list of recorded finds from the area is given in Appendix 3 of the Archaeology Report.

### **3.3.1.3 Cartographic sources**

Reference to cartographic sources is important in tracing land use development within the development area as well as providing important topographical information on sites and areas of archaeological potential. Primary cartographic sources consulted consisted of the Ordnance Survey 6" maps, first and later editions (T.C.D. Map Library).

### **3.3.1.4 Previous Excavations**

The excavation bulletin website ([www.excavations.ie](http://www.excavations.ie)) was consulted to identify any previous excavations that may have been carried out within the study area. This database contains summary accounts of all the excavations carried out in Ireland from 1985 to 2001. A total of three excavations were carried out in the area. Details of previous excavations are listed in Appendix 3 of the Archaeology Report.

### **3.3.1.5 Historical research**

Primary historical sources consulted included: Bronze Age cemeteries in Kildare (Mount C), The long stone Punchestown (Leask), Ireland in Prehistory. England (Herity & Eogan) and The Hayes Index amongst other publications.

### **3.3.1.6 Archaeological and Historical Background Prehistory (c. 4000 BC – AD 500)**

There have been three stone axeheads and a flint fragment recovered from the study area in the townlands of Mylerstown and Robertstown (See Appendix 3). Polished stone axeheads are the most characteristic object type associated with the Neolithic period in Ireland.

Around 2500BC, metal started to replace stone as the basic material used in the manufacture of almost all tools and implements; a Bronze Age socketed axehead was recorded within the study area at Robertstown (Appendix 3). The Bronze Age period in Kildare is also represented by Early Bronze Age burials, dating to the period between c. 2300- 1500 cal BC. There are c. 30 burials in Kildare that date to this period. They are pit burials and stone-built cists containing inhumations and cremations associated with food vessel pottery and cinerary urns. They frequently occur in cemeteries and it is suggested that single occurrences may represent ploughed out cemeteries (Mount, 1993). The majority of these lie to the east of the study area, in the foothills of the Wicklow Mountains. Five Early Bronze Age cemeteries were uncovered in Kildare and Carlow between 1933-1959, with a minimum of 22 graves containing a minimum of 34 individuals.

There is little in the way of documentary evidence for the close of this period relating to Kildare or its inhabitants. However limited records do survive. There is an occurrence documented in the Book of Leinster in a work entitled 'The Seige of Howth', involving the king and queen of Leinster in the 1<sup>st</sup> century AD. The tale is of the death of the king in battle and the subsequent death of his queen, in grief. Mesgegra is the king in question, and Buan, his queen, documented as residing in Howth.

### 3.3.1.7 Early-medieval Period (c. AD 500- 1170)

As for most of Ireland, early medieval settlement evidence in Co. Kildare is characterized by the presence of ringforts. Leinster is one of the lowest density areas of ringfort distribution. This may not be truly reflective of activity in the area at the period of most intensive ringfort construction, from c. 400- 700AD.

Ringforts or raths, as they are also known, in the east of the country, are typically *univallate* circular enclosures measuring an average 30m in diameter. The enclosing element is typically an earthen bank and external ditch, usually c. 3m wide. Occasionally, there is more than one enclosing element, forming *multivallate* ringforts. The ringfort is probably the most conspicuous and certainly the most prolific type of monument in the Irish countryside. They are not purely of a military nature, with the majority being the enclosed farmstead of the free farmers of the Early Christian period. The origins of the ringfort appear to be from the Iron Age or Late Bronze Age but the majority are Early Christian in date c. AD 400 – 1200. There are two ringforts in Kilmeage. Enclosures are enclosed areas, which are still extant, but which do not fall easily within the classification of other known monument types such as ringforts. It also covers sites discovered by aerial photography. It is impossible to define their exact nature. There is one enclosure in Kilmeage.

Other significant early medieval activity in Kildare is represented by the proliferation of early Christian activity in the form of churches and monastic settlements. The name Kildare is derived from Cill Dara – the

church of the oak. Kildare town was established on the site of the 5<sup>th</sup> century nunnery founded by St Brigid. Kildare lies c.16km south of the study area. Elsewhere in the county, there is a 5<sup>th</sup> century ecclesiastical establishment at Monasterevin, founded by St Evin.

The arrival of Christianity was the catalyst for a major change in the landscape in Ireland. The earlier landscape of forts and fields was slowly replaced by nucleated settlements that began with the establishment of monasteries (and nunneries) in places like Kildare town. Kildare was in ancient times one of the most important ecclesiastical settlements in Ireland. It has two cathedrals, but is comparatively small place. The tradition was such that monastic settlements were areas of sanctuary and thus attracted a population which in turn gave way to the tradition of fairs being held at Early Christian centres. They were proto-urban settlements (Swift 1998). There are two church sites within the general study area, one of them at Rathernan which appears to be an 18<sup>th</sup> century building, and the second church site; a grass covered mound in the townland of Ballintine represents the site of a church of which its date is unknown.

There are no recorded archaeological finds of medieval date within the study area but a medieval potsherd has been recorded in the surrounding vicinity of the study area, this was medieval glazed ware and was found in the Townland of Jigginstown.

### **3.3.1.8 Late medieval and post medieval period (c. AD 1170 - 1900)**

The Anglo-Norman invasion of Ireland in 1169 gave rise to the establishment of a string of frontier defensive fortifications along the boundary of what came to be known as the Pale.

The former *tuath* of Offelan is made up of the Anglo-Norman *cantreds* of North and South Salt, Keathy, Oughteranny, Clane and North and South Naas.

Naas is located c. 12km east of the proposed development. When the Normans arrived the Barony of Naas was granted by Strongbow to Maurice FitzGerald. The grant was confirmed to his son, William FitzMaurice. by Henry II in 1177, Under the Anglo-Normans many changes were made. The parish church, originally dedicated to St Patrick or the local St Corban, was rebuilt and re-dedicated to St David, the Welsh patron saint.

King Henry IV granted Naas its first charter as a Corporation in 1409. Four years later, in 1413 King Henry V granted the corporation power to collect tolls at all the entrances to the town. A new charter was granted by Queen Elizabeth I in 1568, adding a Sovereign to the Corporation. Naas was granted further charters by James I in 1609 Charles I in 1628, and by Charles II in 1671. These charters governed the town until 1840 when Act of Parliament dissolved the Corporation.



Between 1840 and 1854, the town was controlled by a Grand Jury; it had Town Commissioners from 1854 to 1900 and since then has been under the administration of the Urban District Council.

### **3.3.1.9 Field Assessment**

The site visit was undertaken in February 2003 in sunny weather. The perimeter of the site was walked and the adjacent fields assessed. The majority of the site has been extensively quarried, with a narrow terrace remaining around the perimeter at original ground level. The terrace ranges from greater than 30m to less than 5m in width. The quarry works reveal top and subsoil to be c. 25-40cm in depth, overlying sand and gravels. Nothing of archaeological interest was noted on the ground around the perimeter of the site.

The lands to the west and south of the site consist of individual and grouped private dwellings. To the north and east of the site the lands consist of fields in open pasture. The pond shown on Figure 2 to the east of the site appears to be man made; it is probably a water hole for livestock.

The site commands very good views of the surrounding countryside (see Plates 1 - 4). Kilmeage church is visible from the site (see Plate 1). There are no visible trace remains of Kilmeage castle (RMP No. KE018:003) and the ringfort (RMP No. KE018:004) is not visible from the site. The ringfort (RMP No. KE018:005) is visible from portions of the southwest and east sides of the site perimeter (see Plate 3), defined by a tree ring and bank.

### **3.3.2 Potential Emissions**

The application site has been nearly completely excavated/disturbed quarried in the past to below the level of potential archaeological remains. There were a total of six recorded monuments within the surrounding area, these included two churches (KD018:001 & KD018:006), two ringforts (KD018:004 & KD018:004) a castle site (KD018:003) and an enclosure site (KD018:002), but these will not be directly impacted by the proposed development. No previously unrecorded archaeological features were noted during field survey. As such, the impact of the proposed development on the cultural heritage of the area will be negligible.

### **3.3.3 Description of Likely Impacts**

As the proposed development will involve the importation rather than the excavation of material, no new or virgin ground will be disturbed by this proposal. It is unlikely therefore that there will be any impacts on archaeology within the area proposed for restoration.

### **3.3.4 Mitigation Measures**

As the potential impact of the proposed development will be negligible, no mitigation measures are required. However, should the proposed

development or related activity (including service roadways) extend into any of the adjacent previously undeveloped land (in particular in the area of the known recorded monuments in the area), then further advice should be sought from Dúchas, the Heritage Service, prior to any such works commencing.

### **3.3.5 Likely Significant Impacts**

As outlined previously, the impact of the proposed development on the cultural heritage of the area will be negligible.

### **3.3.6 References and Consultations**

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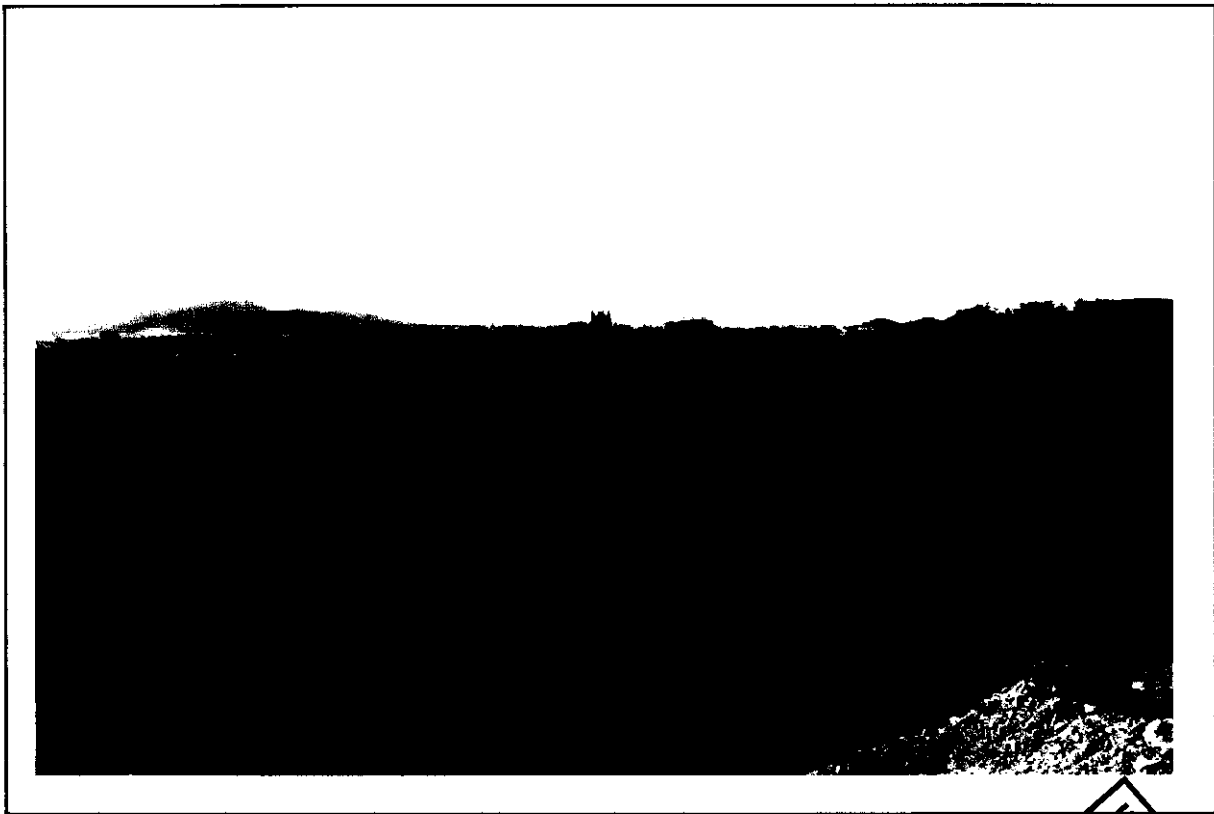
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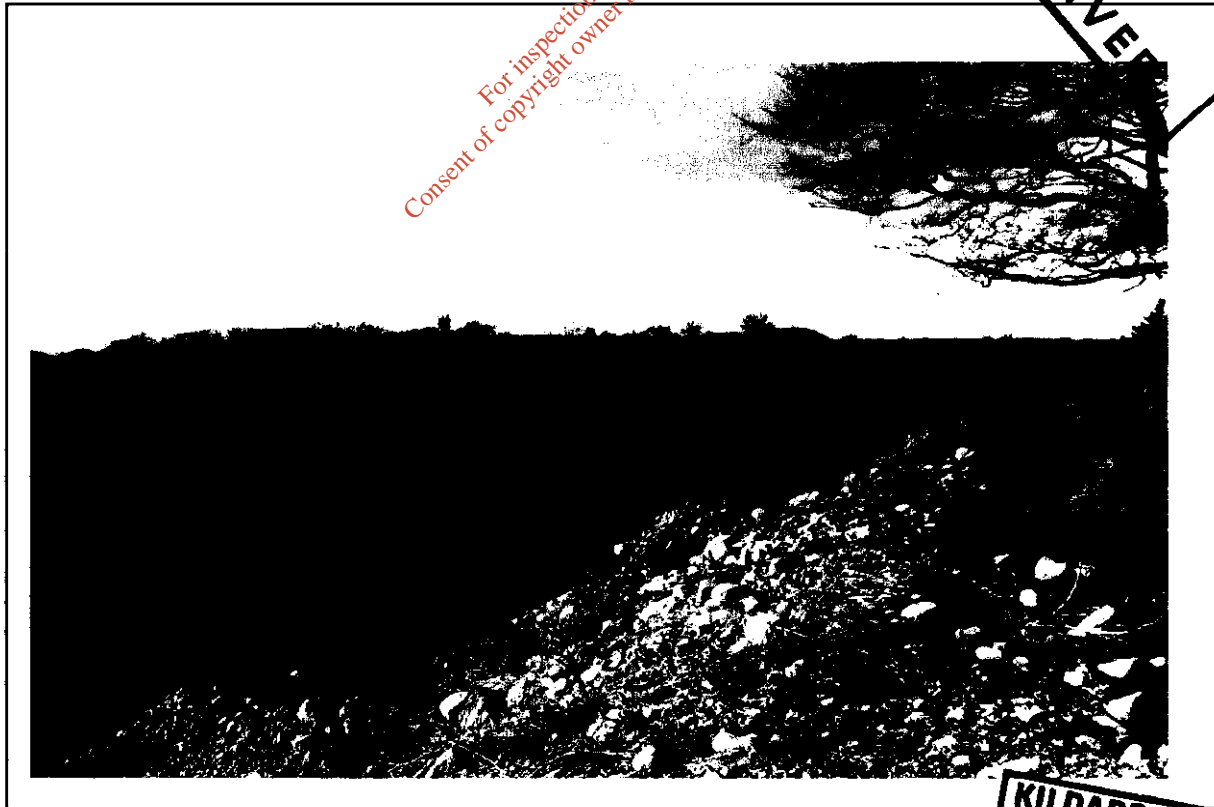
The Irish Stone Axe Project Database. Department of Archaeology: University College Dublin.






<b>Cultural Resource Development Services Ltd.</b> Archaeological & Geological Consultants  Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	Plate No: 1 Title: Kilmeage Job No: 416	Client: ERM Ltd Photo By: SM Date: June 2003
	View of Kilmeage church from the southeast corner of the site facing west.	

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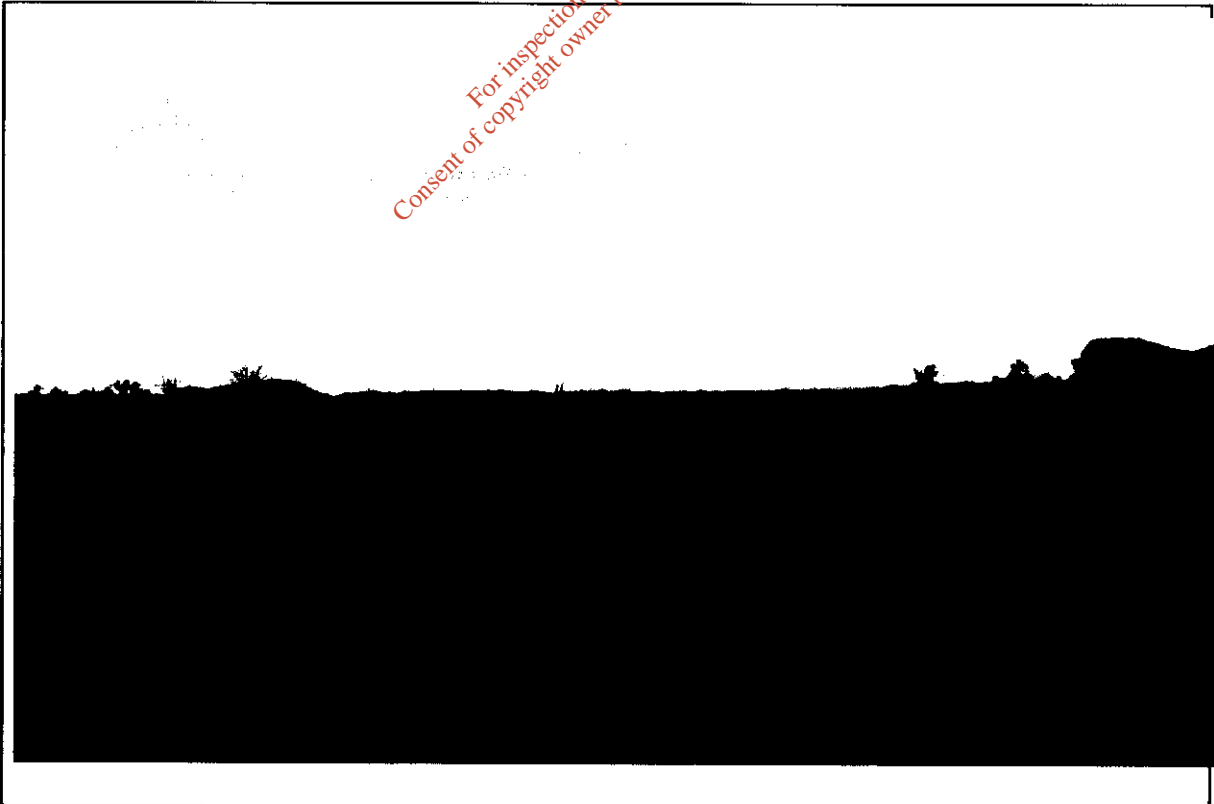
<b>Cultural Resource Development Services Ltd.</b> Archaeological & Geological Consultants  Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	Plate No: 2 Title: Kilmeage Job No: 416	Client: ERM Ltd. Photo By: SM Date: June 2003
	View from the southeast corner of the site, facing north.	


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	Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	View from southeast corner of site towards ringfort (KD18-03), facing east.	



<b>Cultural Resource Development Services Ltd.</b> Archaeological & Geological Consultants		Plate No: 4 Title: Kilmeage Job No: 416	Client: ERM Ltd. Photo By: Date: June 2003
	Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	View from east of site facing west.	

### 3.4 Flora And Fauna

#### 3.4.1 Existing Environment

##### 3.4.1.1 Introduction

A baseline ecological survey of 'The Pit' and its environs at Kilmeage, Co. Kildare was undertaken by Ms. Sinead Hanrahan (B.A. Mod. Environmental Science) and Mr. Conor Wall (M.Sc., Dip. EIA Management). Impacts and mitigation measures were also identified and discussed in this submission.

##### 3.4.1.2 Field Work

The site was visited on 12 June 2003. Descriptions of the habitats within the site were made following "A Guide to Habitats in Ireland (Fossitt 2000). Hedgerows were also identified using the Clements and Tofts (1992) as a guide to describing the hedgerows.

Due to the time limitations of the survey, it was not possible to compile a full species list of flora and fauna at the site at all times of the year. However, observations made during this survey identify the habitats encountered at the site and its environs, and an evaluation is made of the present ecological significance of the site with respect to the potential impacts of the proposed development.

##### 3.4.1.3 Site overview

The site is located immediately northeast of the village of Kilmeage, Co. Kildare, and flanked to the south and west by two local public roads. The surrounding land to the north and east is agricultural and fields of improved grassland. To the west and south is residential housing.

##### 3.4.1.4 Designated Areas

The site is not covered by any nature conservation designation. Two proposed Natural Heritage Areas (pNHAs) are however situated within 5 km of the Kilmeage site. These are listed in Table 3.4.1 below.

**Table 3.4.1: pNHAs in close proximity to Kilmeage Site**

Site Code (pNHA no.)	Name	Distance from Site
2104	Grand Canal	ca. 2 km
395	Mouds Bog	ca. 4 km

PNHAs are currently legislated for in the Wildlife (Amendment) Act 2000. It should be noted, however, that these pNHAs identified above will not be impacted upon by the proposed development.

### 3.4.1.5 Habitats and Flora

As the site has undergone sand and gravel extraction for greater than 60 years, no intact habitats remain within the main boundaries of the pit. The pit sides and bottom are largely un-colonised sands and gravels, with little or no topsoil to support colonisation.

Fringes of semi-natural habitat remain around the pit periphery. The main habitats and species descriptions within the site are described in Section 3.4.1.6 and are outlined in Figure 8.

### 3.4.1.6 Habitat description

The following section describes in detail the different habitats identified at 'The Pit' during the June 2003 survey. These habitat descriptions are in accordance with the Heritage Council publication entitled "A Guide to Habitats in Ireland" (October 2000), which was used as a reference document. Figure 8 outlines depicts the location of the different habitats identified, namely:

- *Dry calcareous and neutral grassland (GS1)*
- *Scrub (WS1)*
- *Non-native/ornamental shrub land (WS3)*
- *Hedgerow (WL1)*
- *Active Quarries (ED4)*

Each habitat description is further described under habitat sub headings e.g. GS1 (A), as depicted on Figure 8.

#### ***Dry calcareous and neutral grassland (GS1)***

The fringes of the site are dominated by dry calcareous and neutral grassland. The main species of grasses within this habitat description, as identified during the June 2003 survey include Cocks foot (*Dactylis glomerata*), Meadow grasses (*Poa* spp.), Bents (*Agrostis* spp.), Creeping fescue (*Festuca rubra*), Meadow fox-tail (*Alopecurus pratensis*) and Yorkshire fog (*Holcus lanatus*).

The main species of broad-leaved herbs identified in this habitat during the June 2003 survey include White clover (*Trifolium repens*), Red clover (*T. pratense*), Birds foot trefoil (*Lotus corniculatus*), Nettle (*Urtica dioica*), Creeping buttercup (*Ranunculus repens*), Creeping thistle (*Cirsium arvense*), Herb robert (*Geranium robertianum*), Bush vetch (*Vicia sativa*), Germander speedwell (*Veronica chamaedrys*), Oxford ragwort (*Senecio squalidis*), Silverweed (*Potentilla anserine*) and great Plantain (*Plantago major*).

Some shrubs (less than 25%) were also identified, including Blackthorn (*Prunus spinosa*), Gorse (*Ulex* spp.) and Bramble (*Rubus fruticosus* agg.).

- GS1 (A)** Has a reasonable species diversity of grasses and broad-leaved herbs.
- GS1 (B)** Has a reasonable species diversity of grasses and a lower diversity of broad-leaved herbs
- GS1 (C)** Has a reasonable species diversity of grasses, a low diversity of broad-leaved herbs and some planted sycamore (*Acer pseudoplatanus*) seedlings.

### **Scrub (WS1)**

A mainly scrub-like habitat was identified to towards the northern and northeastern fringes of the site, as identified on Figure 7.

- WS1 (A)** Small area dominated by Bramble (*Rubus fruticosus* agg)
- WS1 (B)** Small area with main species including Gorse (*Ulex europaeus*) and Bramble (*Rubus fruticosus* agg).

The following habitat sub-areas described below are also depicted on Figure 8.

### **Non-native/ornamental shrub land (WS3)**

A non-native shrubland habitat was identified towards the centre of the pit adjoining the existing buildings. This small area is colonised by invasive garden shrub species including Butterfly Bush (*Buddleja davidii*) and Willow (*Salix* spp.)

The following habitat sub-areas described below are also depicted on Figure 8.

### **Hedgerow (WL1)**

A total length of ca. 480m was surveyed in 3 hedges fringing the northwest, north and northeast boundaries of the site. They are all Hawthorn (*Crataegus monogyna*) dominated hedges. Other species typically identified within these hedgerows includes Elder (*Sambucus nigra*), Ash (*Fraxinus excelsior*), Ivy (*Hedera helix*) and occasional mature Beech (*Fagus sylvatica*).

The ground flora in all hedgerows surveys typically includes Bramble (*Rubus fruticosus* agg), Gorse (*Ulex galii*) and Dog Rose (*Rosa canina*). Overall the hedges are species poor and of low ecological value.

The following habitat sub-areas described below are also depicted on Figure 8.

- WL1 (a)** Hedgerow is moderately sparse in cover
- WL1 (b)** Hedgerow is sparse in cover
- WL1 (c)** Hedgerow is dense in cover

### **Active quarries (ED4)**

Currently the site is operated by N&C Enterprises Ltd. for aggregate extraction and distribution activities. This combined with the steepness of the pit faces has led to little or no vegetation cover across the site, mainly due to the absence of topsoil material.

#### *Birds*

The high level of disturbance at the site has led to limited habitat availability for birds. However, where open sand faces are present, these could result in colonisation by sand martins as observed in other sand pits in the north Kildare area.

The moderate hedgerow cover does also provide some cover for common bird species such as wren, blackbird and song thrush. Numerous swallows were spotted in the area.

#### *Mammals*

Some rabbit droppings were noticed in the dry calcareous grassland. No evidence of fox or badger activity was observed, however it is possible that these animals frequent the area.

### **3.4.1.7 Evaluation**

There are no sites for nature conservation within the general vicinity of the proposed area of restoration. The site consists of a worked out sand and gravel pit coming to the end of its production life. Land use in the vicinity of the site includes residential and agricultural uses.

The habitats contained within the site are of low ecological value due to the nature of ongoing extraction activities within the site. In the surrounding area the agricultural grassland and tillage is a highly managed habitat and is also of very low local ecological value.

The hedgerows identified within the vicinity of the site are typical for this type of rural setting, and are not considered to be significant in terms of species diversity.

### **3.4.1.8 Characteristics of the Proposed Development**

The site requires restoration work as it represents a possible hazard and potential development area immediately adjacent to the centre of the village of Kilmeage. N&C Enterprises Ltd. propose to backfill the large void or pit with inert material and restore the site to its former status. The proposed gentle grades following restoration should then allow an after use such as grazing and/or public amenity.



### 3.4.2 Potential Emissions

As described above, the proposed development will require the backfilling of the entire site area, which will remove any habitats within 'The Pit' area. However, as outlined on Figure 7, the majority of the pit floor and surrounding pit faces are devoid of habitat. Those areas within the pit that have vegetation cover are of low ecological value. Therefore the removal of these habitats during the backfill operations is of little significance in terms of impact.

### 3.4.3 Description of Likely Impacts

The reinstatement of the sand and gravel pit will result in the infilling of most of the site. This constitutes a minor negative impact of local significance. The area to be filled is of low ecological value as the prolonged disturbance has led to little vegetation coverage.

A small area dominated by non-native shrub **WS3** and small area of dry calcareous grassland **GS1 (b)** will be removed. This is a minor negative impact as these habitats are of low ecological value.

#### 3.4.3.1 Indirect Impacts

Dust from the infilling may impact on surrounding hedgerows.

#### 3.4.3.2 Residual Impacts

The infilling will result in the loss of a small area of shrub **WS3** and small area of dry calcareous grassland **GS1 (b)**. The potential for sand matins colonising sand rich faces at the site will also be removed following backfilling of the site.

### 3.4.4 Mitigation Measures

Following the completion of backfilling and overall restoration works, grading and re-contouring etc., planting of hedges and treelines will be undertaken at the site in accordance with the landscape plan outlined in Section 3.8. This will enhance the existing ecological status of the site from its present state. The species selected for planting will include a variety of native species such as ash, beech, hawthorn and blackthorn. Cluster planting of trees will facilitate better development of the associated ground flora. This will create additional habitat for colonisation by a range of native birds, mammals and insects.

It is envisaged that following the implementation of the landscape programme described above, there will be an overall ecological gain for the site and its environs once the site is fully restored.

The dust impact on the hedgerows will be minimised by road dampening during periods of dry weather

### 3.4.5 Likely significant impacts

Assuming the management of the facility is in accordance with the Local Authority requirements under the permitting and planning legislation, and the mitigation measures outlined above are implemented satisfactorily, there should be no significant impacts of the proposed development on flora and fauna.

### 3.4.6 References

Clements, D. K. and Tofts, R. J. (1992). *A methodology for the ecological survey, evaluation and grading of hedgerows.*

Fossitt, J. A. (2000). *A guide to habitats in Ireland.* Heritage Council, Kilkenny.

Phillips, R. (1977). *Wild flowers of Britain.* Pan books Ltd, Britain.

Webb, D. A, Parnell, J. and Doogue, D. (1996). *An Irish Flora.* Dundalgan Press Ltd, Dundalk.

### 3.5 Human Beings

The following Section was prepared by Environment & Resource Management Ltd. and Traffic Wise Ltd.

In general human beings can be impacted by dust and noise arising from the restoration of the site. The effects of dust and noise on humans are dealt with elsewhere in this EIS.

The human beings section has been broken down into the following subsections:

- Population Statistics
- Land-use and housing
- Infrastructure
- County Development and Waste Management Planning
- Local Industry
- Tourism
- Traffic

An environmental assessment of the impact of the development on human beings is provided below. A separate environmental assessment of traffic has been prepared and is included in the next section (Section 3.6).

### **3.5.1 Existing Environment**

#### **3.5.1.1 Population Statistics**

The 2002 census report produced by the Central Statistics Office details population figures in terms of towns and their respective populations.

The site of the proposed facility is located in the town of Kilmeage. In 2002 Kilmeage had a population of 436 persons, a decrease of 3.3% over the 1996 census.

#### **3.5.1.2 Land Use and Housing**

The site of the proposed facility is located within the town of Kilmeage. As described previously, the site is a nearly exhausted sand and gravel pit. The perimeter of the site is ca. 124 mOD. The land to the north and east of the site is pasture with some tillage; to the south and west of the site includes Kilmeage village.

The local infrastructure and development are depicted in Figure 2.

#### **3.5.1.3 Infrastructure**

The Prosperous to Kilmeage rural road passes to the south of the site. Most of the traffic for current and future operations at the site will use both the R415 Allen to Kilmeage regional route (coming from the M7), and the Prosperous to Kilmeage route.

The proposed facility will receive a water supply from an on-site groundwater source. Potable water will be provided by means of a water disperser in the temporary offices. The principal water demand at the site during restoration will predominantly be for the temporary offices and toilets, and as a dust suppressant.

Sewage generated on-site by employees will be managed through the use of a toilet unit linked to a closed septic tank unit. This temporary septic tank will be removed upon completion of the restoration works.

The site will have a power connection, which will enter from the south along the current site entrance. The site will also have a telephone and fax connection.

#### **3.5.1.4 County Development Plan**

The Kildare County Development Plan 1999 to 2004 currently governs Kildare County in terms of strategic development policies. Within this development plan, a number of policies are outlined which are relevant to the proposed restoration project at 'The Pit', Kilmeage, and are detailed in this section.

### **3.5.1.5 Special Villages**

A number of villages are set out in the 1999 Development Plan as "Special Villages" because they possess an overall special amenity character and special quality (Section 1.11.7). According to the 1999 Development Plan:

*"It will be the policy of the Council that this character and quality will be retained, and that all new developments will have to conform to this. It will also be the Council policy to encourage amenity and environmental improvement schemes to these villages, so as to enhance their character"*

Section 2.8 of the 1999 Development Plan also outlines in detail the policies regarding these special villages, which includes Kilmeage.

### **3.5.1.6 Extractive Industry**

Section 2.29 of the 1999 Development Plan includes policies in relation to the extractive industries operating in the Kildare jurisdiction.

*"It is a policy of the Council that a survey and examination of both existing pit areas and potential sand and gravel deposits in the county be undertaken and to assess the interactions between the development of these resources and future land uses. To assist in the survey, it is intended that an aerial survey of all sand and gravel workings in the county is made. This will establish the current extent of existing workings and will pinpoint areas where rehabilitation is needed".*

As indicated in this policy, it is the intention of the Council to identify sites where rehabilitation will be needed in the future. The proposed restoration of 'The Pit' in Kilmeage would result in the rehabilitation of this site, which would subsequently improve the current status of the site and comply with the intent of the County Development Plan

It should also be noted that in Section 2.29, the Development Plan refers to the type of material to be used as backfill for the rehabilitation of pits.

*"The use of landfilling with waste, other than topsoil, subsoil and builder's rubble, is not considered to be an acceptable method of rehabilitation of pits".*

#### *Recycling Policy*

Regarding recycling of material within Kildare County, Section 1.18.6 of the County Development Plan states the following:

*"It is the policy of Kildare County Council to encourage the reduction at source, reuse, recycling and recovery of waste".*

Backfilling of the pit with inert C&D waste materials will represent a waste recovery activity and accordingly an application was lodged for a waste

permit, as required under Waste Management (Permit) Regulations 1998 (S.I. No. 165 of 1998).

### **3.5.1.7 Waste Management Plan for County Kildare**

The Waste Management Plan for County Kildare was consulted. In general it articulates plans with regard to the management of wastes generated within its own boundaries.

With regard to private development it makes mention of existing private facilities in County Kildare. In particular it states the following:

*"The Council will encourage private sector collectors in the use of approved privately operated disposal facilities"*

### **3.5.2 Potential Emissions**

Potential emissions, which relate to dust (Section 3.1), groundwater (Section 3.7), noise (Section 3.8) and surface water (Section 3.9) are dealt with in this overall Section 3

Traffic is dealt with in Section 3.6.

It is not thought that the proposed development will negatively affect /contravene population, land-use and housing, County/Local Plans, local industry and tourism.

### **3.5.3 Description of Likely Impacts**

The most likely impacts are due to dust, noise and traffic. They are more fully described in other sections as outlined previously.

### **3.5.4 Mitigation Measures**

Mitigation measures for dust, noise, groundwater, surface water and traffic are described in their respective sections.

In short measures will be taken to minimise the aforementioned and take actions to reduce any potential impacts on human beings.

### **3.5.5 Likely Significant Impacts**

If the appropriate measures no significant effects of the development on human beings is envisaged.

A waste permit will require various environmental monitoring to ensure that this is the case over time.

### **3.6 Traffic**

Traffic is recognised as an important factor in terms of environmental impact on human beings. A separate environmental assessment of traffic has been prepared by specialist traffic engineers Traffic Wise Ltd.

Traffic Wise Ltd. was retained to advise on the traffic, transportation and access issues relating to the proposed restoration of 'The Pit', Kilmeage, Co Kildare.

In this EIS, Mr. Julian Keenan of Traffic Wise Ltd. identifies the existing traffic patterns associated with the existing site operations and assess the relative changes in traffic generation to and from the site under the current application.

Traffic Wise Ltd. comments on how the traffic associated with the proposed development can be accommodated on the local roads network. Where appropriate, measures to address the management of both the existing traffic and development traffic on the local road network are discussed, so also is the likely future operation of the general local roads network in the vicinity of the proposed development.

This EIS, which addresses the likely traffic impact of the proposed development and provides a description of the physical characteristics and land-use requirements in relation to the transport requirements of the proposed development, is structured in accordance with the general advice provided in the Institution of Highways & Transportation document 'Guidelines for Traffic Impact Assessment' which is recognised by Transportation Planners to represent a structured approach to the preparation of Transport Assessments (formerly Traffic Impact Assessments). The guidelines provide suggested headings based on current best practice and it is these headings (where relevant) under which the EIS is written.

#### **3.6.1 Existing Conditions**

##### **3.6.1.1 Study Scope**

In establishing the scope of a traffic impact assessment the Institution of Highways and Transportation advises as follows;

*"Although most TIAs relate to large or extensive developments it should be recognised that the movement of two milk tankers to a remote farm down a country lane may, in certain circumstances, be deemed to be unacceptable by the planning authority. In contrast, some city centre developments may attract a large proportion of their trips by public transport. This is often ignored because, whilst car trips form a much lower relative trip proportion, their impact often requires more detailed analysis."*

*"It is, therefore, not possible to provide any hard and fast rules as to what constitutes a significant traffic impact and hence one for which a full traffic*



impact assessment should be undertaken. The Guidelines therefore recommend that a TIA should normally be produced where one or other of the following thresholds are exceeded:

Traffic to and from the development exceeds 10% of the two-way traffic flow on the **adjoining highway**

Traffic to and from the development exceeds 5% of the two-way traffic flow on the **adjoining highway**, where traffic congestion exists or will exist within the assessment period or in other sensitive locations

These thresholds should be applied in the absence of alternative guidelines from the highway (roads) authority in the form of approved or adopted policy."

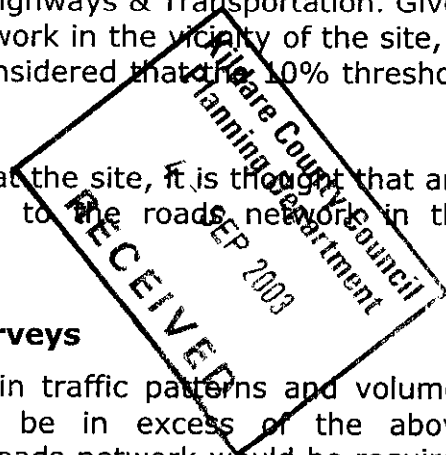
"It is recommended that the threshold approach should also be used to establish the area of influence of the development. Hence the study should include all links and associated junctions where traffic from the development will exceed 10% of the existing traffic (5% in congested or other sensitive locations) or such other threshold as may have been adopted by the highway (roads) or planning authority."

In accordance with the above advice, in this assessment of the future likely operation of the proposed development, firstly the changes in traffic patterns at the site are investigated. Should such analysis show significant increases in the volume of traffic to and from the site we will assess the percentage variance and determine if any locations on the adjoining roads network are likely to experience an increase in traffic flow greater than the thresholds identified by the Institution of Highways & Transportation. Given the remote location and general roads network in the vicinity of the site, in accordance with the above advice, it is considered that the 10% threshold applies in this instance.

Given the modest nature of the proposals at the site, it is thought that any appreciable traffic impact will be limited to the roads network in the immediate vicinity of the development.

### 3.6.1.2 Data Collection - Traffic Surveys

As discussed above, should the changes in traffic patterns and volumes associated with the current application be in excess of the above thresholds, traffic surveys of the existing roads network would be required in order to establish the level of impact on existing road users in the vicinity of the development. Should surveys be required, the details will be provided in the following sections in which existing and future likely traffic generation will be investigated.



### 3.6.1.3 Modal Choice/Trip Attraction (Traffic Operation of Existing Waste Facility)

To determine the traffic patterns and general traffic generation characteristics of the existing operation, daily delivery records at the site were inspected. To undertake a comprehensive review of typical yearly operations we have selected months of the year aimed at reflecting the normal daily traffic generation at the site whilst also providing a general overview of any possible seasonal variations in trade, which may exist.

The months for which data were obtained were March, July, September and November for the past two years (2001 & 2002). For each of the individual months we have reviewed a complete week of typical entry and exit data. This base data has been collated from records maintained by the operator of the site.

A summary of findings of the investigation into the current traffic patterns associated with operations at the existing pit is included in Table 3.6.1 below:

**Table 3.6.1: Review of Traffic Generation at Existing Site**

Year	Month	Daily Trip Generation						Average Excl. Sat
		Mon	Tue	Wed	Thurs	Fri	Sat	
2001	March	87	110	84	136	88	45	101
	July	35	55	27	32	35	10	37
	September	70	40	44	43	51	13	50
	November	27	51	52	28	39	15	39
2002	March	66	41	49	38	28	16	44
	July	45	59	36	50	33	20	45
	September	74	60	58	78	37	21	61
	November	103	90	40	56	55	24	69
Average		63	63	49	58	46	21	56

It can be seen from the above data that, as would be expected, there are indeed fluctuations in the volumes of traffic generated to the existing site. In general these fluctuations are not seasonal but are related more to weather conditions for the time of year and general market forces in the construction industry.

It can be seen from the above Table 3.6.1 that on average the existing site generates approximately 56 vehicle trips per day. The maximum recorded vehicle generation rate in the two year period 2001-2002 was 136 vehicles in a single weekday whilst the minimum recorded value during a weekday was 27 vehicles. Both of these recorded values occurred in 2001.

As stated above the average daily trip generation for the period 2001-2002 is 56 vehicles per day. The average daily traffic generation recorded for 2002 alone is 55 vehicles per day. It has been confirmed by the operator of the site that operations over the past year or so have been closely monitored and rationalised, this is reflected in the 2002 figures which for 2002 show a more settled operation in terms of traffic generation at the site; especially when compared with the figures recorded in 2001.

From the 2002 daily records, ignoring the one high figure for the Monday in November (103) the traffic generation rates at the site do not appear to fluctuate appreciably above or below the average.

Therefore from the above Table 3.6.1 it can be seen from the 2002 data that normal daily traffic generation is approximately 56 vehicles per day. Normal variance in traffic generation is approximately  $\pm 20$  vehicle trips per day i.e. up to 76 trips in total. From our experience on similar sites these are considered normal daily fluctuations at a facility of this nature.

### 3.6.2 Potential Traffic Movements

Under the current application it is proposed to reinstate the existing pit. It is understood that the estimated quantity of materials required to restore the pit is approximately 1.5 Million tonnes.

The likely daily and annual levels of traffic associated with the restoration of the have been predicted on the basis of the following assumptions provided by ERML.

**Table 3.6.2: Assumed Operating Conditions for Restoration Project**

Item	Units	Value
Total Quantity of Material	Tonnes	1.5 million
Operating Days	Days per year	300
Average load weight	Tonnes/load	18
Filing Period	Years	5, 6 or 7

Table 3.6.3 below provides a summary of the volume of traffic likely to be generated at the site under timescales of five and seven years.

**Table 3.6.3: Estimate of Future Traffic Generation assuming 1.5 Million Tonnes of Material to be Placed**

Timescale (years)	Average No. Loads In (per year)	Daily Trip Generation
5	16,667	56
6	13,889	46
7	11,905	40

It can be seen from the above that if materials are to be imported over a five to seven year period, the average traffic generation on the local roads network is likely to be in the region of 40 to 56 trips per day. As the current operations on the site will diminish over time, as the site is restored it is anticipated that the site as whole will not attract more than 76 trips per day if the filling is over a five year period in the worst case. The number of trips per day naturally reduces as the filling period increases.

### 3.6.3 Description of Likely Impacts

As the number of trips attracted to the site will be in the range of what has been previously experienced at the site the likely impacts on the existing road network and local residents are expected to be insignificant.

### 3.6.4 Mitigation Measures

At present, some of the vehicles entering onto the site arrive empty. As part of this development, it is proposed that these vehicles to the extent possible will arrive at the site with inert wastes for backfill. Once unloaded, these same trucks will carry aggregate materials out of the site for distribution.

The net effect of the importation of wastes and continued exportation of aggregate materials will therefore not result in an significant additional traffic on the local roads network over and above that assessed above.

### 3.6.5 Likely Significant Impacts

The routing of vehicles to and from the site is currently dictated to some extent by the sources/destination of materials and is therefore very much market lead.

The notional sources of fill material for the restoration, which have been identified as major settlements within 30km of the Kilmeage site, include:

- Dublin area
- Robertstown - Prosperous - Clane
- Carragh - Naas - Clane
- Newbridge
- Kilcullen
- Kildare Town
- Rathangan and Edenderry

Traffic-Wise has reviewed the current routes to the site in light of the likely sources for reinstatement and consider that the general routing of vehicles would not alter significantly under the current application.

### **3.7 Soils, Geology, & Groundwater**

This section assesses the impact of the development on soil, geology, and groundwater.

#### **3.7.1 Existing Environment**

The existing geological and hydrogeological environments were explored by detailed site investigations, which were carried out at the site between May and June 2003 by staff from ERML. These investigations included trial pitting, standpipe installation, groundwater sampling/ laboratory analysis, and groundwater flow mapping. Results of these investigations are included in the following sections.

A detailed literature survey was also undertaken. Trial pit and standpipe locations are depicted on Figure 3.

##### **3.7.1.1 Detailed Site Description**

'The Pit', as it is commonly known, is located immediately to the northeast of the crossroads in Kilmeage village, Co. Kildare, and is accessed along a gravel surfaced private road from the public road to Prosperous.

The Kildare County Council sewage treatment works are located to the west of the site. The site itself is flanked by residences to the south and west. The remainder of the adjoining lands are used as agricultural pastureland and tillage.

Surface water generated from rainfall at the site typically drains to the lowest point in the pit floor, which is located to the eastern part of the pit. Surface water outside the pit is understood to follow existing drains found along the roadside. Figure 4 shows a detailed layout of the site.

### 3.7.1.2 Site Geology

#### *Overburden Geology*

During the site investigations, 5 trial pits were excavated both in the pit floor and on the higher ground to depths up to 3.8 metres below ground level (bgl). Groundwater was encountered at depths ranging from 0.5 to 3.6 metres bgl in the pit floor trial pits. Locations of these trial pits are indicated on Figure 3. Details of the field logs are included Appendix 4.

In general the underlying quaternary deposits across the site comprise silty sandy gravels with frequent cobbles and boulders.

#### *Bedrock Geology*

Bedrock beneath the glacial sequence consists of Old Red Sandstones. These sandstones are typically made up of reddish conglomerates, sandstones, siltstones and mudstones, with minor greenish equivalents. The Old Red Sandstone is poorly exposed and the full thickness is unknown but has been shown to be more than 12 metres (Kildare Inlier).

#### *Aquifer Classification*

In general hydrogeological terms, the site is underlain by two hydrogeological units, namely:

- shallow water table in overburden sands and gravels
- deeper bedrock aquifer in sandstones

The water-bearing sand and gravel at this site has not been classified by the Geological Survey of Ireland. The Old Red Sandstone is restricted in extent and has little hydrogeological significance. In terms of aquifer potential, the old red sandstones, siltstones etc. are considered unproductive except in local zones. The Geological Survey of Ireland (GSI) Draft Map 5 Aquifer Map has classified this bedrock aquifer as LI, or moderately productive only in local zones.

### 3.7.1.3 Groundwater Vulnerability

The assessment of groundwater vulnerability for the area is based on guidelines issued by the Geological Survey of Ireland (Groundwater Protection Schemes 1999), and more recently the Draft Groundwater Protection Maps for the Kildare region. These guidelines and Draft Protection Maps evaluate the natural protection of an area against contamination through the overburden characteristics of the area.

As defined by the GSI, 'vulnerability is the term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities'. The Draft Groundwater Vulnerability Map for Kildare (No. 6) shows the



vulnerability of the first groundwater encountered to contaminants released at depths of 1-2 metres below the ground surface.

In terms of vulnerability, the Kilmeage site is situated in a moderate vulnerability zone as per the draft GSI Groundwater Vulnerability Map for the area (Map 6). Draft Map 7 of this series outlines Resource Protection Zones for the Kildare area, and classifies the Kilmeage site as LI/M.

In terms of groundwater usage, the Kilmeage area does not appear to be utilised. A preliminary assessment has indicated that residents in the vicinity of the site (ca. 250 metres) are on local mains water supply.

#### **3.7.1.4 Groundwater Investigation**

Following the excavation of trial pits TP1 to TP4 inclusive, groundwater monitoring standpipes were installed in each of these pits, which are located on the pit floor. The locations of these standpipes are indicated in Figure 2 (TP1-TP4 inclusive).

All four groundwater sampling locations were sampled on 29 May 2003, and samples from TP2, TP3 and TP4 were forwarded to Geochem Group Ltd. There was insufficient inflow at monitoring location TP1 to analyse in the laboratory.

Water levels at all four monitoring locations were also recorded prior to the sampling event. Figure 2 includes details of groundwater flow direction in the overburden hydrogeological unit. The groundwater in the gravels flows in an easterly direction, which appears to be in keeping with the surrounding topography, falling from west to east.

#### **3.7.1.5 Groundwater Results**

Three groundwater samples were analysed for detailed chemical analysis. Results of this analysis are included in Table 3.7.1 below. Copies of the original analysis are included in Appendix 5 of this EIS.

Groundwater indicator parameters such as conductivity were all within their normal range for this type of environmental setting, ranging from 511  $\mu\text{S}/\text{cm}$  to 825  $\mu\text{S}/\text{cm}$ .

Some of the nitrogen containing parameters were slightly elevated above normal background levels in the laboratory analysis, namely Ammoniacal Nitrogen and Nitrite. Elevated nitrogenous compounds in the groundwater typically originate from agricultural sources. In general terms, the detected concentrations in groundwater samples taken at the site reflect typical baseline conditions for this type of agricultural setting and there was no indication of any type of industrial contamination.

**Table 3.7.1: Groundwater Monitoring Results (May 2003)**

PARAMETERS	UNIT	TP2	TP3	TP4
Ammoniacal Nitrogen	N mg/l	0.7	1	0.8
Chloride	Cl mg/l	21	18	22
Dissolved Oxygen	O <sub>2</sub> mg/l	8.5	8.6	7.7
Conductivity	µS/cm	852	511	614
pH*	-	7.07	7.04	6.76
Temperature*	°C	11.7	13	13
BOD	mg/l	3	2	<2
COD	mg/l	<15	<15	<15
Boron	B mg/l	<0.05	<0.05	<0.05
Calcium	Ca mg/l	159.5	63.85	124.4
Copper	Cu mg/l	<0.05	<0.05	<0.05
Fluoride	F mg/l	0.2	0.2	0.2
Iron	Fe mg/l	<0.05	<0.05	0.08
Nickel	Ni mg/l	<0.05	<0.05	<0.05
Lead	Pb mg/l	<0.05	<0.05	<0.05
Magnesium	Mg mg/l	16.94	13.85	13.02
Manganese	Mn mg/l	<0.05	<0.05	<0.05
Potassium	K mg/l	2.2	2	1.6
Sulphate	SO <sub>4</sub> mg/l	33	49	20
Sodium	Na mg/l	13	11.2	9
Alkalinity	CaCO <sub>3</sub> mg/l	270	160	210
Orthophosphate	PO <sub>4</sub> mg/l	<0.03	<0.03	<0.03
Total Org. Carb.	C mg/l	2	<2	<2
Nitrite	NO <sub>2</sub> mg/l	0.06	<0.05	0.12
Nitrate	NO <sub>3</sub> mg/l	31.3	25.6	19.1
Total Solids	mg/l	60	56	96
Arsenic	As mg/l	<0.05	<0.05	<0.05
Barium	Ba mg/l	0.12	<0.05	0.15
Zinc	Zn mg/l	<0.05	<0.05	<0.05
PRO C5 - C9	µg/l	<10	<10	<10
PRO C10+	µg/l	<10	<10	<10
DRO	µg/l	<10	<10	<10
Mineral Oil	µg/l	<10	<10	<10
Benzene	µg/l	<10	<10	<10
Toluene	µg/l	<10	<10	<10
Ethylbenzene	µg/l	<10	<10	<10
Xylene	µg/l	<10	<10	<10
MTBE	µg/l	<10	<10	<10

**LEGEND**

< = Less Than

\*Note - Parameters recorded at well head by ERML staff.

**3.7.1.6 Summary and Conclusions**

'The Pit' site is underlain with permeable gravels greater than 3 metres thick, which are subsequently underlain with an unproductive bedrock unit. In terms of vulnerability, by taking the gravel aquifer to be the first groundwater encountered, the site has a vulnerability rating of LI/M (Draft GSI Groundwater Protection Scheme Map 7)

A preliminary survey indicated that there appears to be no groundwater users in the vicinity of the site (250 metre radius). However two boreholes were identified towards the south of the site during the literature search by the GSI.

Groundwater quality at the site reflects typical baseline conditions for this type of agricultural setting and there is no indication of any type of industrial contamination.

As inert materials only will be used to restore the pit, there will be little or no effect on the underlying shallow gravel aquifer.

Section 4 of this EIS below indicates that the shallow groundwater table will be sampled and analysed for pollutant indicator parameters on an annual basis.

### 3.7.2 Potential Emissions

During operation and post completion the potential emissions are as follows:

- Machinery and operational vehicle fluid losses in parking areas, in refuelling areas, and in maintenance areas;
- Vehicle and machinery fuel storage;
- Hardstand area runoff.

### 3.7.3 Description of Likely Impacts

In the event of an uncontrolled emission from a vehicle or storage tank, there will be a localised potential impact on soil quality as a result of potential emissions. This impact is likely to be short term since the contaminant sources will gradually be attenuated by natural effects over time.

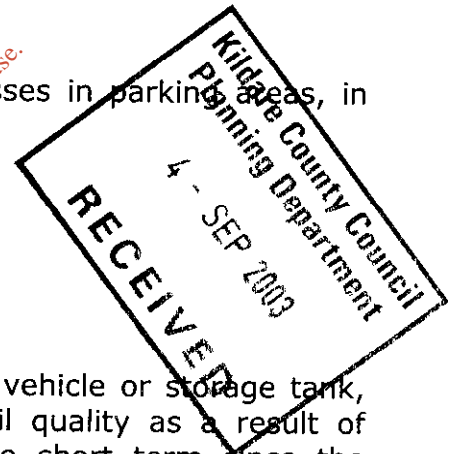
Similarly there would be a likely but virtually undetectable reduction in groundwater quality downgradient of the site in the event that uncontrolled potential emissions were released to ground.

### 3.7.4 Mitigation Measures

The following mitigation measures have therefore been proposed:

- Liquid from any temporary wheel wash will drain into a soakaway
- Fuel and lubricant storage for site vehicles and machinery will be stored in appropriate double lined mobile fuel tanks

Operational waste will be segregated for offsite disposal into canteen, oily rags, waste oils, non-recyclable plant waste, and other miscellaneous



waste. Separate containers will be provided for waste oils and oily rags etc.

A groundwater monitoring programme will monitor any changes in static water levels and water chemistry potentially associated with the proposed development.

### **3.7.5 Likely Significant Impacts**

In the event that the mitigation measures identified in Section 3.7.4 are implemented, it is predicted that there will be no measurable or significant impacts to soils, geology or groundwater quality as a result of the site development.

## **3.8 Landscape**

### **3.8.1 Existing Environment**

The character of the existing landscape is one which is typical for this type of north Kildare rural setting, and includes slightly elevated sand and gravel deposits in an otherwise lower-lying bog landscape. The topography of the overall area is low-lying, with an elevation of ca. 120 to 140 mOD. The higher ground represents gravel deposits as evidenced by the presence of a pit near Kilmeage. The Hill of Allen, located ca. 3 km to the southwest, dominates the landscape in the area, rising to an elevation of 219m.O.D. some 130 metres above much of the surrounding area.

Within the site there are a number of small areas of different landscape character and these are shown on Figure 2. The dominant area is the pit itself, which is quite devoid of vegetation. On the northern and eastern terraced margins of the site there is a narrow strip of calcareous grasses.

The hedges here are predominantly of hawthorn and gorse with some mature beech and ash.

A series of photos (Photoviews 1-4 inclusive) illustrate these areas of landscape character within the site as well as views across the site and the surrounding landscape. The locations of these views are shown on Figure 3.

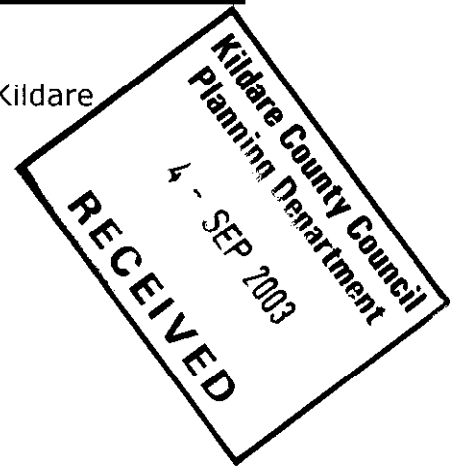
#### **3.8.1.1 Principle Private and Public Views**

The views into the site from the adjacent public roads are for the most part restricted due to the location and topographical setting of the site. This is aided by the presence of a screening berm, which flanks the site to the south and east. A new concrete wall and clay berm also flanks much of the western boundary. A thick hedgerow skirts the northern boundary and beyond this hedgerow there are no residences or roadways where views of the site could be observed.

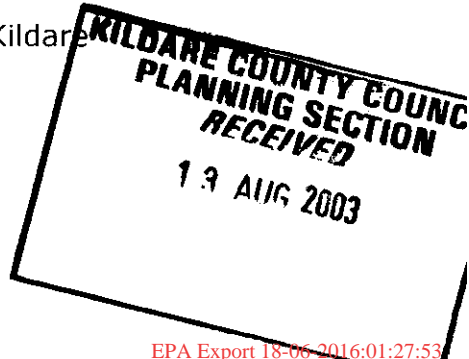
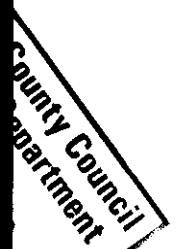


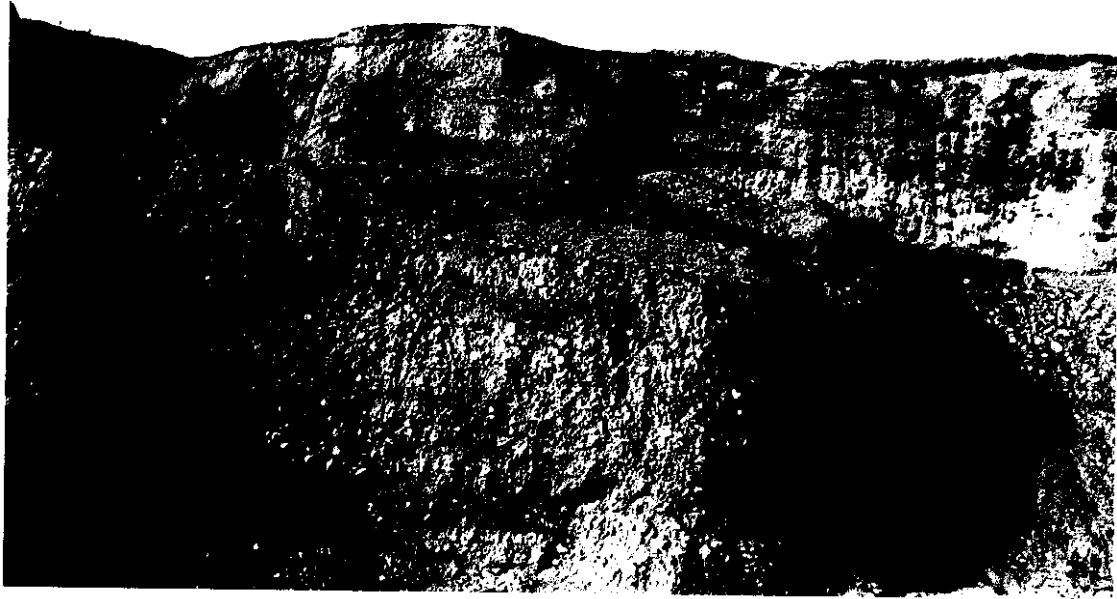
Photoview 1: View from east of 'The Pit', Kilmeague, Co. Kildare

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Photoview 2: View from west of 'The Pit', Kilmeague, Co. Kildare





Photoview 3: View facing west at the base of 'The Pit', Kilmeague, Co. Kildare



Photoview 4: View facing east at base of 'The Pit', Kilmeague, Co. Kildare



The most prominent view of the site is from the Rathernan to Kilmeage road ca. 1 km southeast of the site.

### **3.8.2 Potential Emissions**

Due to the lack of significant views into the site, the landscape impact of the proposed development will be minimal. Any minor existing views into the site will be screened by internal site earthworks and boundary tree and hedge planting.

The main visual screen is the clay berm running along the southern boundary of the site. The existing landscape of the site, being a disused gravel pit, is already severely degraded in visual terms and the proposals for restoration offer a means of achieving restoration in the medium term.

### **3.8.3 Description of Likely Impacts**

As the site can be considered a scar on the landscape in its present state, the proposed restoration of the pit will in effect improve any views onto the site once fully backfilled. Therefore no likely impacts from a landscape viewpoint are envisaged. However should berms be constructed during the restoration activities, prior to grass colonisation these temporary screens will be visible.

### **3.8.4 Mitigation Measures**

Mitigation measures include for further landscape works prior to the commencement of restoration of the pit, which will help to reduce the visual impact of the site even further. These works include for additional berms and the enhancement of perimeter hedges and trees.

#### **3.8.4.1 Enabling Landscape Works**

Enabling landscape works will be carried out early on in the programme of restoration works in order to provide both advanced screening to later development and immediate screening of views.

#### **3.8.4.2 Perimeter Hedges**

All of the hedges on the perimeter of the site will be reinforced with Hawthorn, *Crataegus monogyna* and Blackthorn *Prunus spinosa*. The hedgerows will be further enhanced with Beech trees (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*). Details of the proposed planting programme are included in the planning drawings.

#### **3.8.4.3 Completed Landscape Works**

The final fully restored site is depicted on Figure 6.

#### **3.8.4.4 Maintenance and Aftercare**

The site will need minimum maintenance after the establishment phase. The fences around the site and around the planted areas will be maintained against livestock. Trees will be weeded for the first two years until they have become established. Those areas sown to a wildflower mix will need no maintenance until after the third year when grasses have become established, after which they should be lightly grazed by sheep. Areas of public access (if any) will require normal maintenance for such situations.

#### **3.8.5 Likely Significant Impacts**

If the mitigation measures are followed there should be no significant effect on the landscape as a result of the proposed facility. When restoration is complete the effect on the landscape will be positive.

### **3.9 Noise**

The following Section was prepared by ERML.

#### **3.9.1 Existing Environment**

This EIS presents the findings of an Environmental Noise Survey carried out at the 'The Pit', Kilmeage, County Kildare on the 22<sup>nd</sup> and the 24<sup>th</sup> July, 2003.

The site is situated northeast of the village of Kilmeage on the Prosperous Road (L-7081-1). The normal hours of operation at the facility are 7:00 am to 6:00 pm Monday to Friday, and 7:00 am to 1:00 pm on Saturdays.

The objective of this survey was to identify the existing noise environment at 'The Pit' in Kilmeage. This survey included the identification of existing noise sources both on and off site. The survey was also undertaken on a weekday, during normal working operations and typical traffic patterns, to ensure that the existing noise environment would be fully represented.

##### **3.9.1.1 Monitoring Locations**

Monitoring locations were chosen in accordance with *ISO 1996: Acoustics – Description and Measurement of Environmental Noise*. Six monitoring locations were selected for this noise survey. Four of these locations (N1, N2, N3 and N6) can be classed as Noise Sensitive Receptors due to their proximity to the site boundary or residential dwellings. Monitoring locations N4 and N5 represent two boundary locations.

The monitoring locations are depicted in Table 3.9.1 and Figure 3.

##### **3.9.1.2 Instrumentation**

A Cirrus CK:831A sound level meter was used to take the noise measurements at the site. This instrument is a Type 1 data logging

integrated sound level meter and meets the requirements of *IEC Publication 651*.

Prior to each measurement, the instrument was calibrated at 94 dB using a Cirrus CR:513A acoustic calibrator.

**Table 3.9.1: Monitoring Locations**

Monitoring Location	Description of Location
N1*	Site Entrance.
N2*	Residence in housing estate west of the site.
N3*	Residence northwest of site
N4	Boundary location northeast of site.
N5	Boundary location east of site.
N6*	Residence located southeast of site.

**\*Noise Sensitive Receptors**

### 3.9.1.3 Methodology

Prior to each measurement the instrument was mounted on a tripod at 1.5m above ground level and 3.5m away from any sound reflecting objects. The Time Weighting used was 'fast' and the Frequency Weighting was 'A weighted'.

In addition, a windshield was used to reduce potential wind interference during measurements.

### 3.9.1.4 Parameters Measured

The following parameters were measured at each of the six locations:

**L<sub>Aeq, 60 min</sub>** – the equivalent continuous noise level in dBA over a 60-minute measurement interval.

**L<sub>A10, 60 min</sub>** – the noise level in dBA equalled or exceeded for 10% of the measurement interval (i.e. 60 minutes).

**L<sub>A90, 60 min</sub>** – the noise level in dBA equalled or exceeded for 90% of the measurement interval (i.e. 60 minutes).

### 3.9.1.5 Results

The measurement results are presented in Table 3.9.2.

### 3.9.1.6 Evaluation of Results

Noise levels at the site ranged between 45.0 dB(A) and 61.6 dB(A). Of the six locations monitored, two locations (N1 and N4) exceeded 55 dB(A), with  $L_{Aeq, 60min}$  measurements of 61.6 dB(A) and 58.3 dB(A) respectively. As depicted in Table 3.9.1, N1 is a noise sensitive receptor and N4 is a boundary location.

The levels recorded at the remaining four monitoring locations were below 55 dB(A).

### 3.9.1.7 Noise Sources in Existing Site

The dominant sources of noise currently at the site are as follows:

#### *Volvo Generator*

The Volvo Generator operates constantly during normal operating hours and is located in a shed towards the northern part of the pit. It should be noted that the shed doors were open during this monitoring round.

#### *Truck Movements*

The daily trip generation at the site is averaged at 56 vehicles per day (see section 3.6 of the main EIS). Truck movements have an impact on the noise environment at the site and in particular at monitoring location N1, which is located at the entrance to the site.

**Note:** Noise from the truck movements is accentuated when the trucks are empty due to the uneven road surface in particular at the site entrance.

Other sources of noise currently at the site include:

- Road Traffic
- Bagging Plant
- Site Machinery

**Note:** A breakdown of the dominant noise sources at each individual noise monitoring location is depicted in Table 3.9.2

### 3.9.2 Potential Emissions

Potential emissions from the proposed development include the increased use of plant/machinery currently used on site during backfilling operations.

### 3.9.3 Description of Likely Impacts

As no additional plant or other equipment is proposed for future restoration activities at the site, there are no additional noise sources to be considered.

Current noise levels are elevated at the entrance to the site, however with the following mitigation measures being adopted, the existing noise environment should improve.

**Table 3.9.2: Results of the Environmental Noise Survey**

Monitoring Location	Date/Time	L <sub>Aeq, 60 min</sub> dB(A)	L <sub>A10, 60 min</sub> dB(A)	L <sub>A90, 60 min</sub> dB(A)	Noise Sources
N1*	22/07/03 16:12:55	61.6	55.7	38.3	<ul style="list-style-type: none"> <li>Trucks entering and leaving the site</li> <li>Road traffic on the R-415, L-7081-1 and L-7085-0</li> </ul>
N2*	24/07/03 09:52:17	45.0	45.8	39.2	<ul style="list-style-type: none"> <li>Trucks entering and leaving the site</li> <li>General site activities</li> <li>Road traffic on the R-415 and L-7076-0</li> </ul>
N3*	24/07/03 11:16:37	52.4	54.0	50.4	<ul style="list-style-type: none"> <li>Site generator</li> <li>General site activities</li> <li>Road traffic on the L-7076-0</li> </ul>
N4	22/07/03 14:06:05	58.3	60.6	55.4	<ul style="list-style-type: none"> <li>Site generator</li> <li>Forklifts operating on site</li> <li>Main bagging plant</li> <li>Small bagging plant</li> <li>Trucks entering and leaving the site</li> </ul>
N5	22/07/03 12:45:56	50.3	50.9	44.0	<ul style="list-style-type: none"> <li>Site generator</li> <li>Main bagging plant</li> <li>Front loader loading trucks</li> <li>Trucks entering and leaving the site.</li> </ul>
N6*	22/07/03 11:27:33	46.1	48.3	42.3	<ul style="list-style-type: none"> <li>Screener running intermittently</li> <li>Road Traffic on the R-415, L-7081-1 and L-7085-0</li> <li>General site activities</li> </ul>

**\*Noise Sensitive Receptors**

### 3.9.4 Mitigation Measures

- Subject to permission, the access road to the site will be levelled and covered with a macadam surface. This will result in reduced noise levels, in particular at N1.
- Subject to permission inert material will be brought into the site for restoration purposes. The applicants propose that trucks entering the site with inert material will be used to transport sand away from the site thereby minimising noise emissions caused by empty vehicles arriving at and departing from the site.
- The doors to the sheds which house the Volvo Generator and the bagging plant will be closed whenever possible to minimise noise emissions from site activities.

In the event that noise levels result in complaints, further mitigation measures will be considered. These measures could include barriers, sound insulation etc.

### **3.9.5 Likely Significant Impacts**

It is predicted that there will be no significant impacts upon the existing noise environment caused by the operation of the proposed restoration activities. All of the likely impacts, which have been identified have been addressed and mitigation measures proposed where necessary to ensure that the impacts remain at acceptable levels.

### **3.10 Surface Water**

The following Section was prepared by ERML. In this section surface water discharges, ephemeral ponding, and all local surface water bodies are discussed.

#### **3.10.1 Existing Environment**

At the present time no true surface water features exist on this site. The land is free draining, and ponding at the base of the pit typically only occurs during the winter months. A small water body is located to the east of the site in an adjoining field, however this is understood to be a man-made feature used for watering cattle.

The closest significant water body is located ca. 2.5 km west of the site, which is the feeder for the Grand Canal and is locally known as the Miltown Feeder.

#### **3.10.2 Potential Emissions**

There are no direct surface water emissions from the pit. However surface water runoff from temporary roads and hardstands will be directed to soakaways in the base of the pit. Runoff from the proposed paved site access road will be directed to roadside french drains and soak holes.

#### **3.10.3 Description of Likely Impacts**

Likely impacts on surface water bodies or as a result of surface water emissions are interpreted as those impacts likely to take place in the event that the necessary preventative measures are not incorporated. These are as follows:

Uncontrolled releases of surface water runoff from areas of contaminating activity such as the vehicle maintenance areas would result in a strictly localised deterioration of groundwater quality. This effect would however not be detectable at any significant distance from the release point due to the dilution factor and attenuating capacity of subsurface.



### **3.10.4 Mitigation Measures**

The following mitigation measures have been included:

- Fuel will be stored in double-lined mobile fuel storage tanks
- Clean surface water will be directed to conventional soakaways;

### **3.10.5 Likely Significant Impacts**

In the event that the mitigation measures identified above are incorporated, it is predicted that there will be no impacts to surface water, significant or otherwise, as a result of the restoration of this site.

## **3.11 Material Assets**

### **3.11.1 Existing Environment**

In the vicinity of the proposed development are private residences, farms, and the village of Kilmeage.

The ultimate goal of this project is to fill this former sand and gravel pit and restore, to the extent possible, the ground to match former levels prior to extraction activities.

The local road network and telephone lines are used by the current activities at the site. No other material assets i.e. water supply, foul sewers, public buildings or power supply are currently used at the site.

### **3.11.2 Potential Emissions**

The restoration activities will result in dust and noise.

Lorries will bring wastes to the site and travel away from the site via public roads.

Sewage will be contained, as portaloos will be used.

### **3.11.3 Likely Impacts**

During operations the existing public road system will be utilised, as is the case during current site operations. The traffic associated with the proposed filling will be the same or less than the current volumes.

Because the site is already largely disturbed there is not likely to be any significant impacts on the landscape as viewed by neighbours looking towards the site.

During the proposed restoration activities, there may be some infrequent and minor inconveniences due to dust and noise. Any of these inconveniences will take place during day-time hours. These potential

inconveniences are discussed in previous sections. It is not thought that they will detract from property values.

Ultimately, the goal of the project is to restore the site and enhance the material assets of the area.

#### **3.11.4 Mitigation Measures**

Mitigation for maintaining the landscape is described in Section 3.8.

Mitigation measures for dust and noise are described in Sections 3.1.

Mitigation measures for traffic are discussed in Section 3.6.

The applicant will seek to meet with local residents and interest groups regularly to ensure issues relating to nuisances that may affect their material assets do not arise.

#### **3.11.5 Likely Significant Impacts**

The local road network will not be significantly affected, as the traffic associated with this development is consistent with current traffic into the site.

The amount of electricity used will be measurable but not significant. The duration of the use will be approximately 6 years.

It is unlikely that the site in its present configuration is having any affect on local residents. The site is generally well screened and not visible from most vantage points.

In the long term the impact of this development will be positive because a disused sand and gravel pit will be restored to former contours, and community amenities may be provided. It is not expected that there will be any negative impact on material assets during the development of this site.

#### **3.12 Interrelationships**

Table 3.12.1 depicts potential interrelationships of the various factors described in this section of the EIS. This table should be read such the item in the most left hand column interacts or affects one of the items to the right (e.g. air (dust) can interact/affect human beings).

**Table 3.12.1: Interrelationship of the Factors**

	AIR	CLIMATE	CULTURAL HERITAGE	FLORA AND FAUNA	HUMAN BEINGS	SOILS, GEOLOGY AND GROUNDWATER	LANDSCAPE	NOISE	SURFACE WATER	MATERIAL ASSETS
AIR (DUST)					X					
CLIMATE						X			X	
CULTURAL HERITAGE					X					
FLORA AND FAUNA										
HUMAN BEINGS (TRAFFIC)					X					
SOILS, GEOLOGY AND GROUND WATER					X				X	
LANDSCAPE				X	X					
Air (NOISE)					X					
SURFACE WATER						X				
MATERIAL ASSETS					X					

Air (Dust), Cultural Heritage, Traffic, Groundwater, Landscape, Noise and Material Assets may affect human beings. The impact of the proposed development as it pertains to the aforementioned is dealt with in Sections 3.1, 3.3, 3.6, 3.7 and 3.8, 3.9 and 3.11 respectively.

The climate (i.e. precipitation) can potentially affect groundwater and surface water. This has been discussed in Sections 3.7 and 3.10 respectively.

The change in landscape as a result of proposed activities could affect the flora and fauna at the site. This is addressed in Section 3.4.

It is unlikely that there will be any significant adverse environmental impacts due to interactions as a result of the proposed development.

#### 4. ENVIRONMENTAL MONITORING

As the restoration of the site is envisaged to take ca. 6 years to complete, it is proposed to undertake annual monitoring at the site. The proposed monitoring regime is presented in Table 4.1 below:

**Table 4.1: Proposed Monitoring at 'The Pit', Kilmeage, Co. Kildare**

Monitoring Parameter	Frequency	Comments
Dust	Annual	It is proposed to monitor dust at the locations shown in Figure 3. Complaints will be recorded and appropriate actions taken
Noise	Annual	It is proposed to monitor noise at the locations shown in Figure 2
Groundwater Monitoring	Annual	A minimum of one upgradient and three downgradient monitoring points will be sampled and analysed over the course of the restoration programme

All monitoring locations are depicted on Figure No. 3 in Appendix 1 of this submission.

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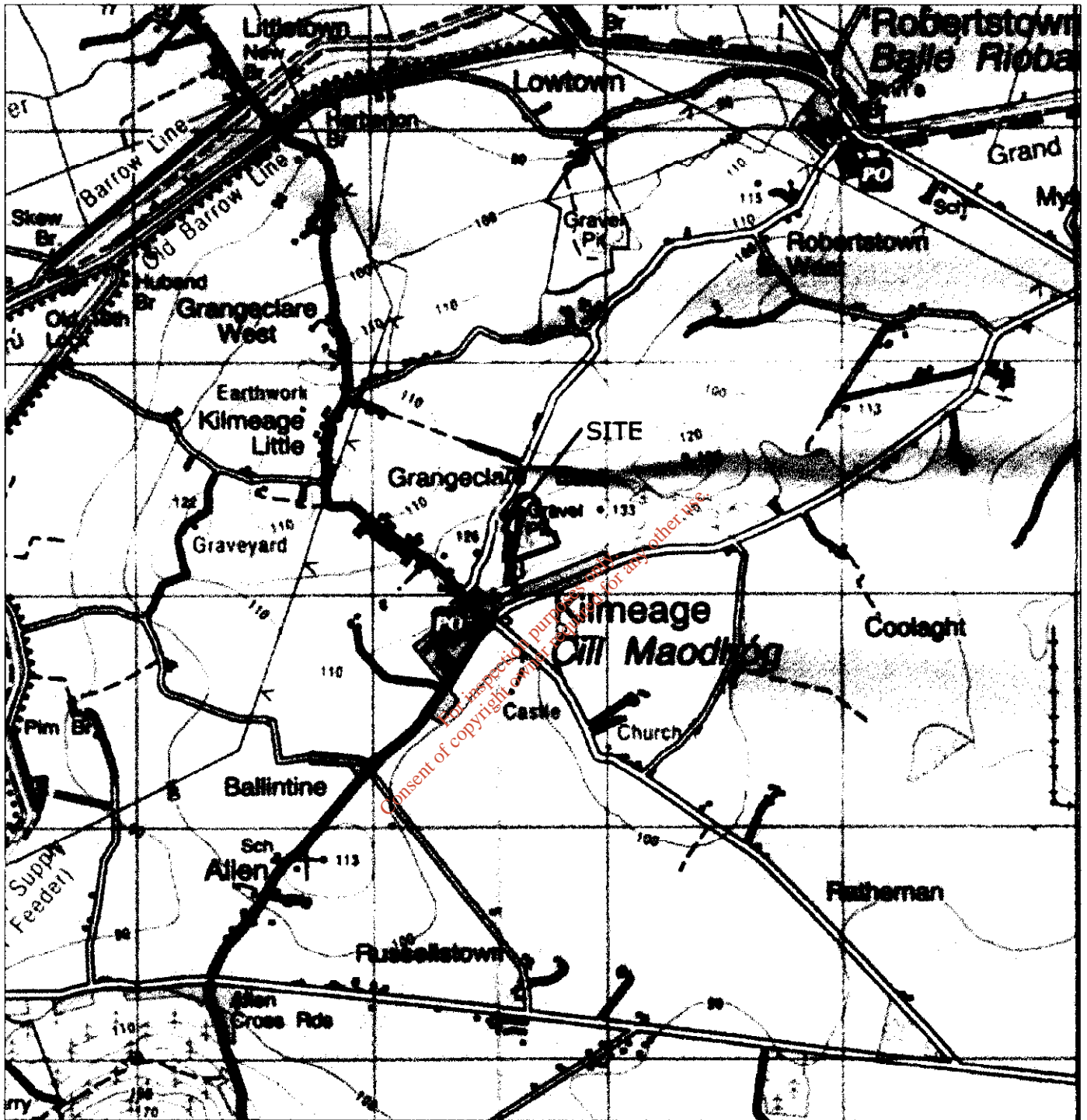
## 5. STATUTORY REQUIREMENTS

### 5.1 Compliance with Requirements of Schedule 6 (S.I. No. 600 of 2001)

The information to be contained in an EIS is specified in Schedule 6 of the Planning and Development Regulations 2001 (S.I. No. 600 of 2001). Table 5.1 describes where the required information may be found within this document.

**Table 5.1: EIS Checklist**

S.I. No. 600 of 2001	Second Schedule. Items (abbreviated)	Location in EIS
1. (a)	Description of Proposed Development	Section 2
(b)	Description of Mitigation Measures	Section 3
(c)	Data Required to Identify and Assess Effects	Sections 1.10, 2 and 3
(d)	Outline of the Main Alternatives Studied	Section 1.7
2. (a) (i)	Description of Physical Characteristics of the Development and Land Use Requirements	Section 2
(ii)	Description of the Main Characteristics of the Production Process	Section 2
(iii)	Estimates, by Type and Quantity of Expected Residues and Emissions	Section 2
(b)	Description of the Aspects of the Environment likely to be Significantly Affected by the Proposed Development Including in Particular: -  <ul style="list-style-type: none"> <li>- Human Beings</li> <li>- Fauna and Flora</li> <li>- Soil</li> <li>- Water</li> <li>- Air</li> <li>- Climatic Factors</li> <li>- Material Assets</li> <li>- Architectural and Archaeological Heritage</li> <li>- Cultural Heritage</li> <li>- Inter-relationship of the above factors</li> </ul>	Section 3.5 Section 3.4 Section 3.7 Sections 3.7 and 3.10 Section 3.1 Section 3.2 Section 3.11 Section 3.3 Section 3.3 Section 3.12
(c)	Description of the Likely Significant Effects	Section 3
(c)	Description of Forecasting Methods Used to Assess the Effects on the Environment	Section 1.12
(d)	Indication of any Difficulties Encountered by the Developer in Compiling the Required Information	Section 1.13



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AR 0056003

OS/DAVERN PROJECTS\N&C ENTERPRISES 02.06\1\LOCATION\PLANNING JULY 03\FIGURE101

Prepared by:  
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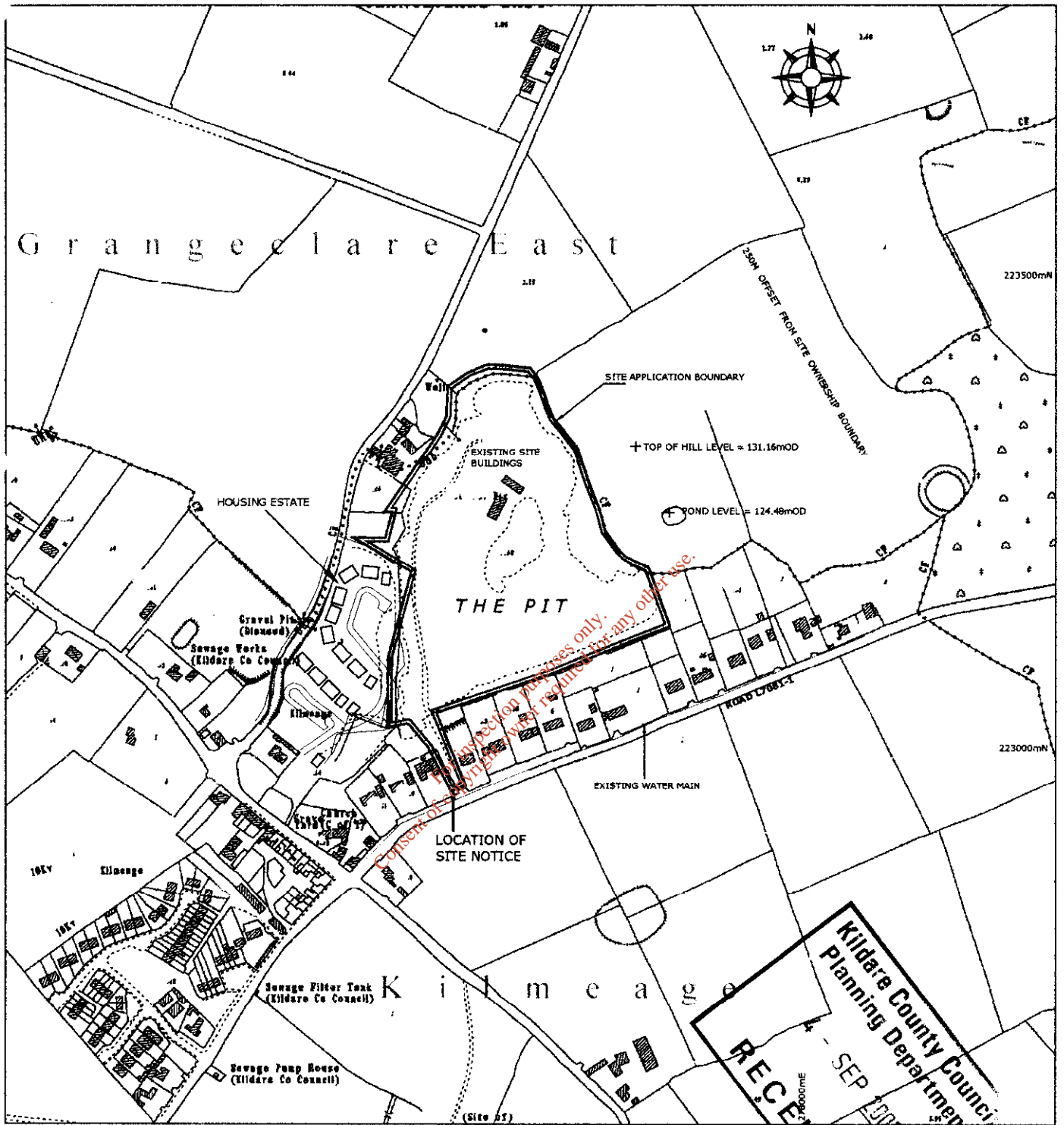
**N&C ENTERPRISES LTD**

RESTORATION OF THE PIT  
KILMEAGE, CO. KILDARE

**SITE LOCATION**

Figure: 01	Scale: 1:25,000A4	Drawn By: CC	Date: 12/08/03
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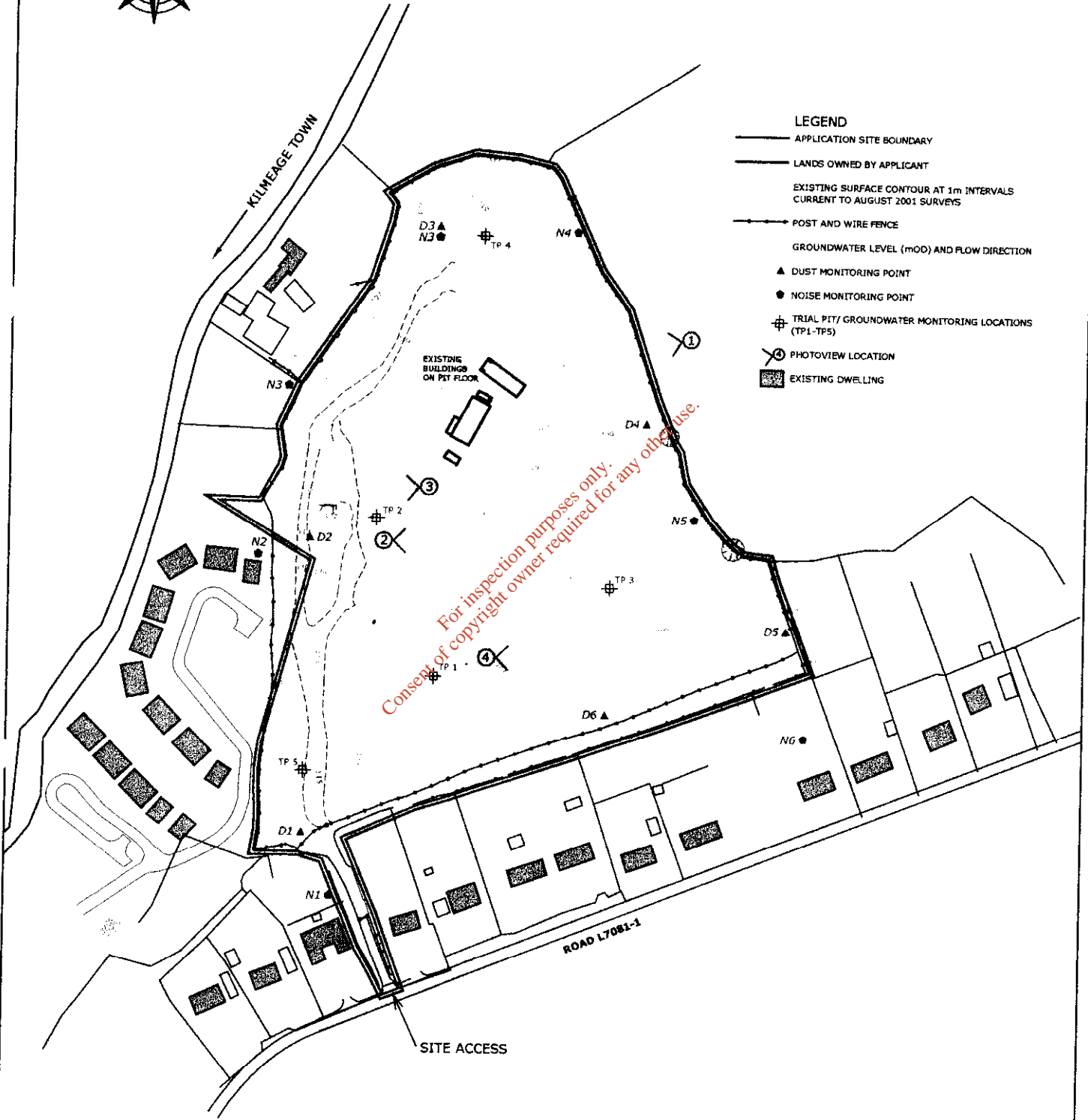
**LEGEND**  
 — APPLICATION SITE  
 — BOUNDARY  
 — LANDS OWNED BY APPLICANT

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 AIR 0056003  
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 3506/3445

CLADARM PROJECTS/INIC ENTERPRISES 02.061/OPTION PLANNING JULY 03/FIGURE 02

Prepared by: <b>Environment &amp; Resource Management Ltd.</b> NO. 3 TARA COURT, DUBLIN RD., NAAS, CO. KILDARE TELEPHONE 045 874411 FAX 045 874549	<b>N&amp;C ENTERPRISES LTD</b> RESTORATION OF THE PIT KILMEAGE, CO. KILDARE		
	<b>SITE LOCATION</b> Figure: 02    Scale: 1:6000A4    Drawn By: CC    Date: 12/08/03		



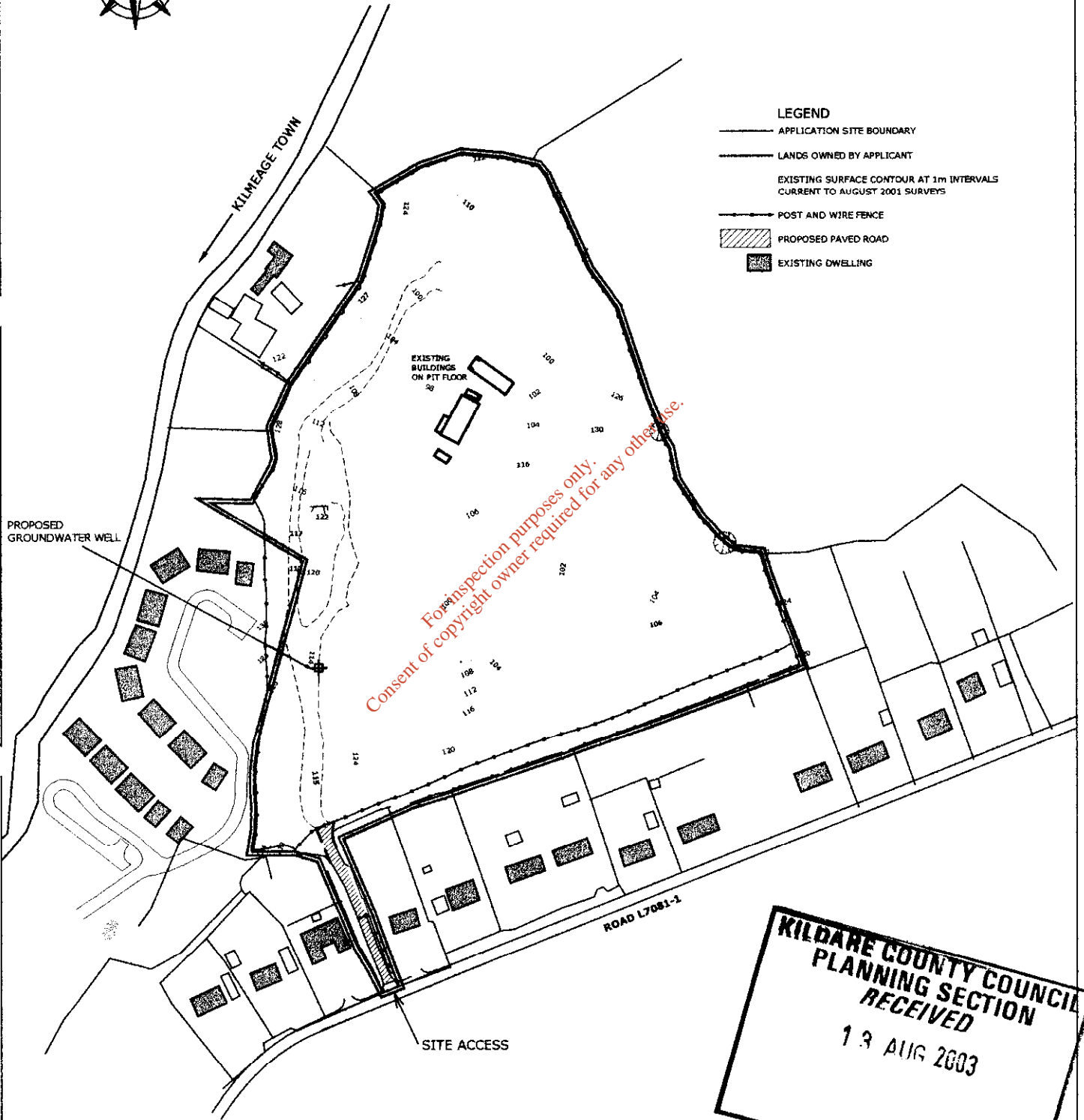
- LEGEND**
- APPLICATION SITE BOUNDARY
  - LANDS OWNED BY APPLICANT
  - - - EXISTING SURFACE CONTOUR AT 1m INTERVALS CURRENT TO AUGUST 2001 SURVEYS
  - POST AND WIRE FENCE
  - GROUNDWATER LEVEL (MOD) AND FLOW DIRECTION
  - ▲ DUST MONITORING POINT
  - NOISE MONITORING POINT
  - ⊕ TRIAL PIT/ GROUNDWATER MONITORING LOCATIONS (TP1-TP5)
  - ④ PHOTOVIEW LOCATION
  - ▒ EXISTING DWELLING

C:\CADAERM\PROJECTS\N&C ENTERPRISES 02 061\OPTION4\PLANNING JULY 03\FIGURES\02

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<b>EXISTING CONDITIONS WITH MONITORING POINTS + PHOTOVIEWS</b>			
Figure: 03	Scale: 1:3000A4	Drawn By: CC	Date: 12/08/03



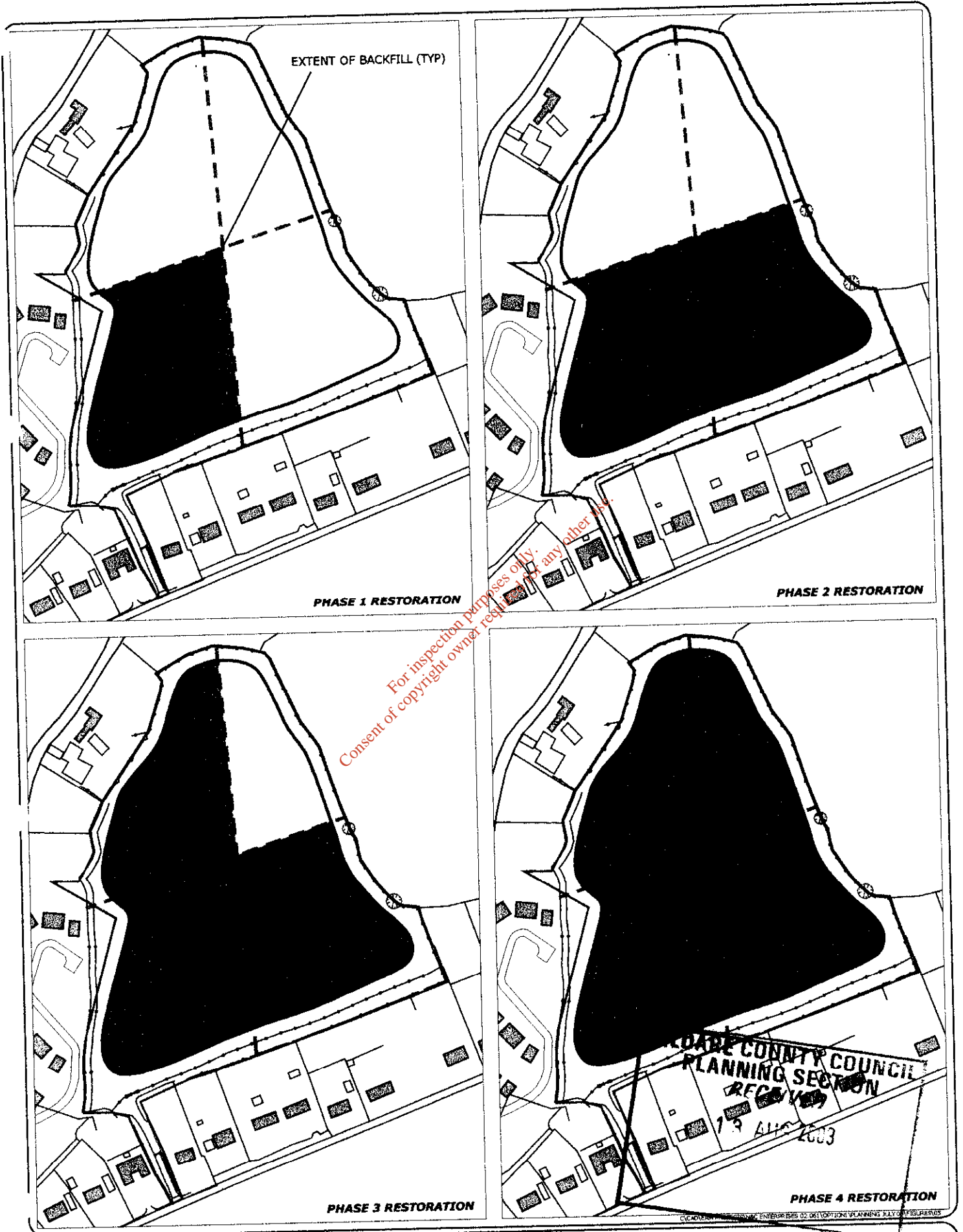
- LEGEND**
- APPLICATION SITE BOUNDARY
  - LANDS OWNED BY APPLICANT
  - EXISTING SURFACE CONTOUR AT 1m INTERVALS  
CURRENT TO AUGUST 2001 SURVEYS
  - POST AND WIRE FENCE
  - ▨ PROPOSED PAVED ROAD
  - EXISTING DWELLING



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Figure: 04	Scale: 1:3000A4	Drawn By: CC	Date: 12/08/03



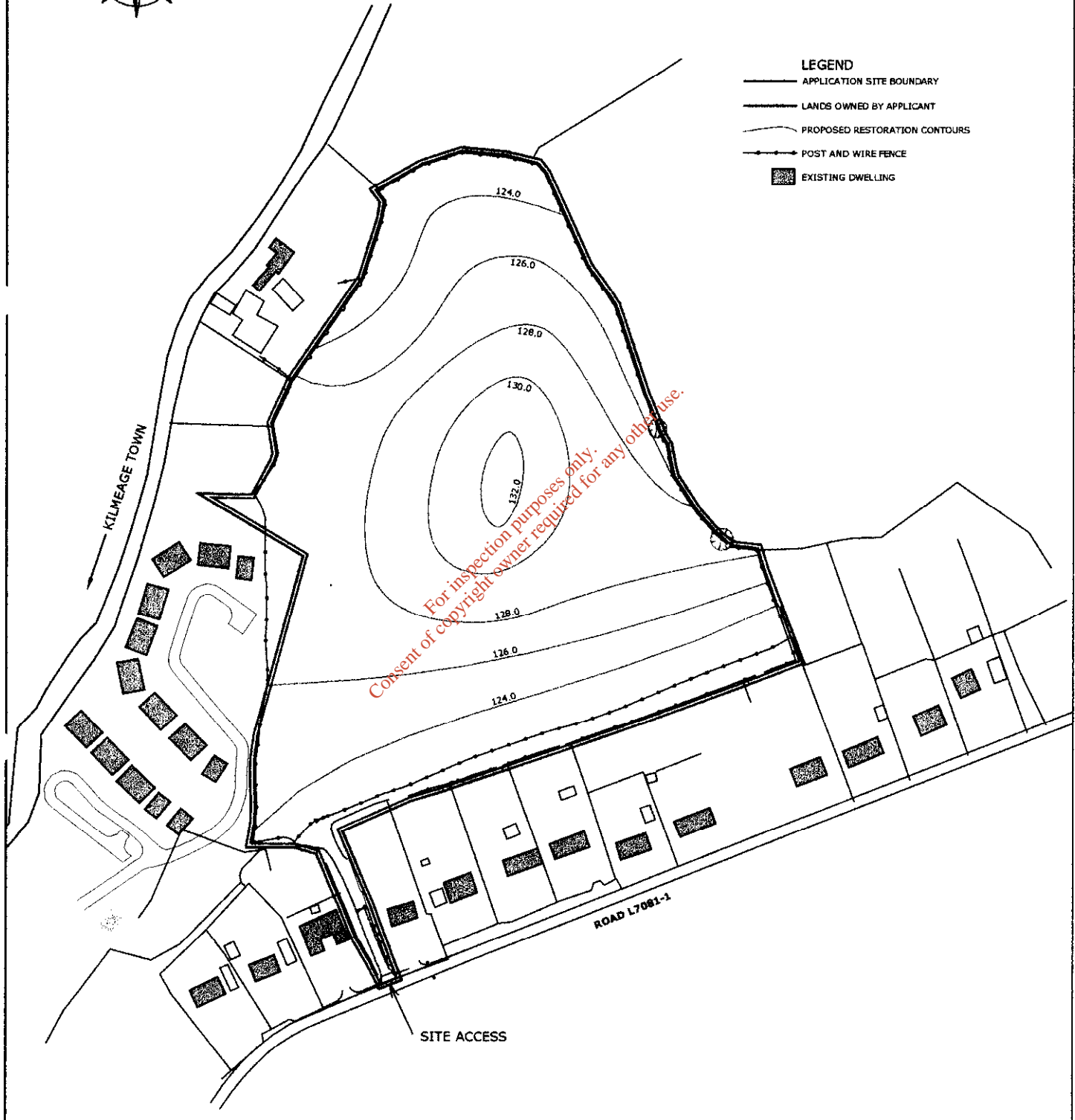
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 RESTORATION OF THE PIT  
 KILMEAGE, CO. KILDARE  
 RESTORATION PHASING PLAN

Figure: 05	Scale: N.T.S	Drawn By: CC	Date: 12/08/03
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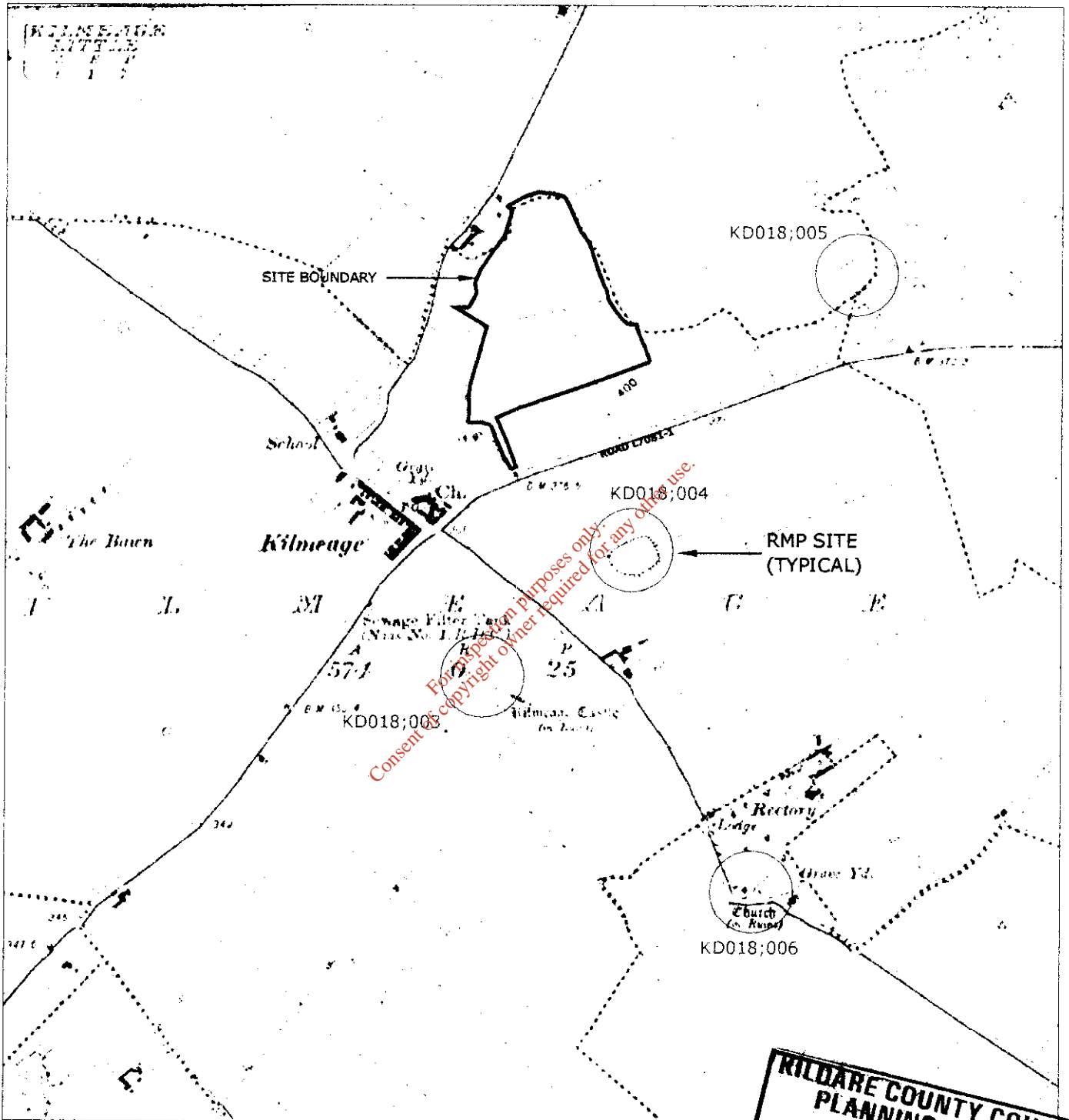
- LEGEND**
- APPLICATION SITE BOUNDARY
  - LANDS OWNED BY APPLICANT
  - PROPOSED RESTORATION CONTOURS
  - POST AND WIRE FENCE
  - EXISTING DWELLING



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TELEPHONE 045 874411 FAX 045 874549

<b>N&amp;C ENTERPRISES LTD</b>			
RESTORATION OF THE PIT KILMEAGE, CO. KILDARE			
SCHEMATIC OF RESTORED LANDFORM			
Figure: 06	Scale: 1:3000A4	Drawn By: CC	Date: 12/08/03



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C:\CAD\ERM PROJECTS\N&C ENTERPRISES 02 061\TOPDOWN\PLANNING JULY 03\FIGURE 07

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TELEPHONE 045 874411 FAX 045 874549

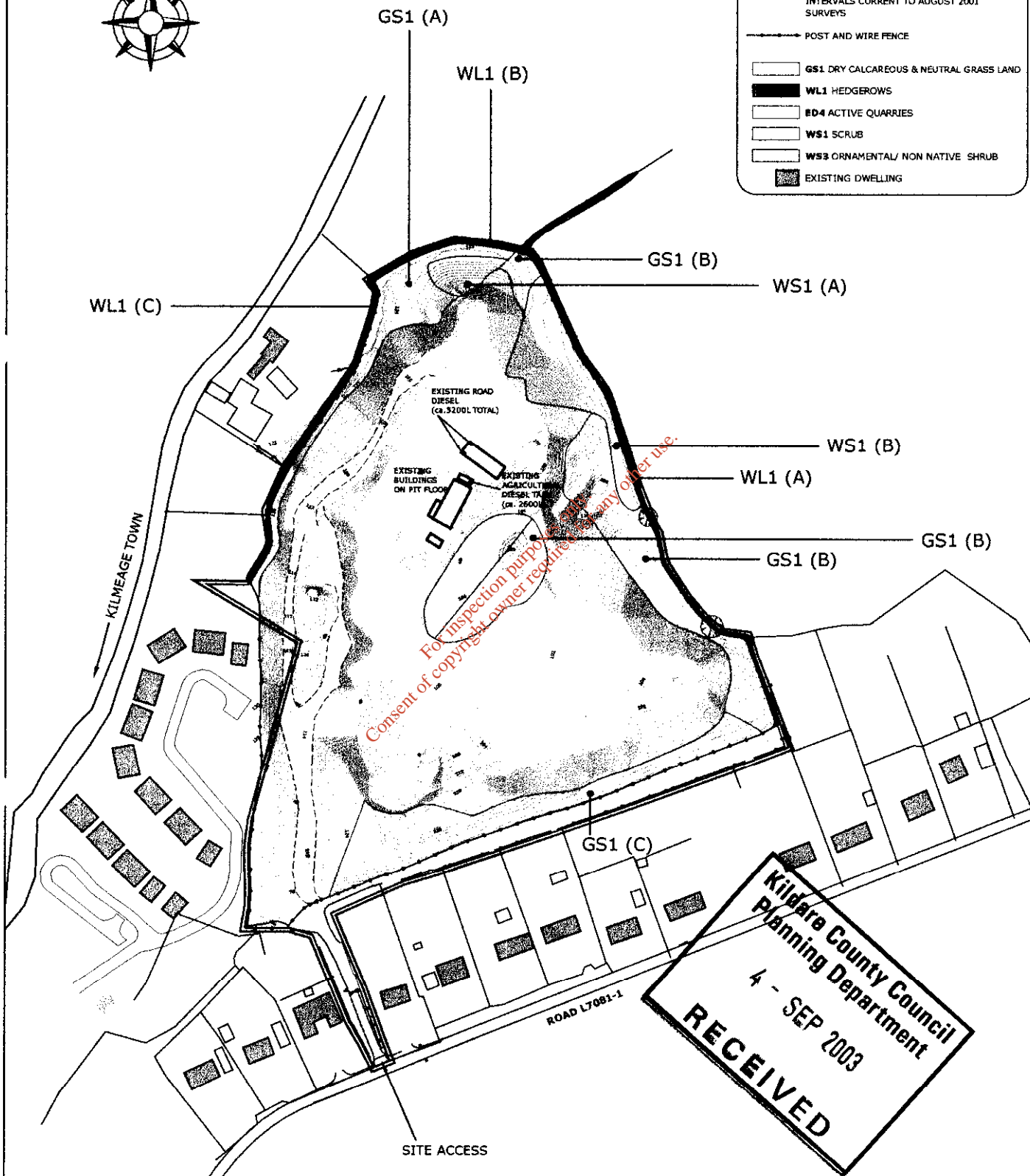
**N&C ENTERPRISES LTD**  
RESTORATION OF THE PIT  
KILMEAGE, CO. KILDARE  
RECORDED ARCHEOLOGY SITES (RMPs) IN THE VICINITY OF THE PROPOSED DEVELOPMENT  
Figure: 07 | Scale: N.T.S | Drawn By: CC | Date: 12/08/03





**LEGEND**

- APPLICATION SITE BOUNDARY
- LANDS OWNED BY APPLICANT
- EXISTING SURFACE CONTOUR AT 1m INTERVALS CURRENT TO AUGUST 2001 SURVEYS
- POST AND WIRE FENCE
- GS1 DRY CALCAREOUS & NEUTRAL GRASS LAND
- WL1 HEDGEROWS
- ED4 ACTIVE QUARRIES
- WS1 SCRUB
- WS3 ORNAMENTAL/ NON NATIVE SHRUB
- EXISTING DWELLING



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 RESTORATION OF THE PIT  
 KILMEAGE, CO. KILDARE  
 HABITAT SURVEY (JUNE 2003)  
 Figure: 08 Scale: 1:3000A4 Drawn By: CC Date: 12/08/03

# Dust Monitoring Results



GeoTesting Ltd  
 21 Unk Business Park, Kilkullen, Co. Kildare  
 Tel.: 045 482248 - Fax: 045 482268  
 Email: geotestingtd@eircom.net - web: www.geotesting.net

Job Number: 03.082  
 Client: ERMIL  
 Client Ref: N & C Enterprises Ltd.  
 Location: Killmeage.

Tested by: A. Cardiff.  
 Date of Report: 14-Jul-03  
 Sampling Period: 12-Jun-03 until 9-Jul-03

Sample ID	Date Sampled	Date Received	Date of Test	Tray Mass g	Final Mass g	Residue Mass g	A cm <sup>2</sup>	T days	F	X g/m <sup>2</sup> /day	Deposit mg/m <sup>2</sup> /day
DM1	09/07/2003	10/07/2003	14/07/2003	1.026	1.053	0.027	62.2	28	10000	0.155	155
DM2	09/07/2003	10/07/2003	14/07/2003	0.997	1.065	0.068	62.2	28	10000	0.390	390
DM3	09/07/2003	10/07/2003	14/07/2003	1.01	1.053	0.043	62.2	28	10000	0.247	247
DM4	09/07/2003	10/07/2003	14/07/2003	1.008	1.348	0.34	62.2	28	10000	1.952	1952
DM5	09/07/2003	10/07/2003	14/07/2003	1.008	1.018	0.01	62.2	28	10000	0.057	57
DM6	09/07/2003	10/07/2003	14/07/2003	0.999	1.006	0.007	62.2	28	10000	0.040	40

X = Dust precipitation in g/m<sup>2</sup> - day  
 A = Collecting area in cm<sup>2</sup> (62.2cm<sup>2</sup> for std dust jars)  
 F = 10,000 cm<sup>2</sup>/m<sup>2</sup> (conversion factor)  
 G = Mass of dust precipitation sample in g  
 T = Period of sampling (collecting time in days)

$$X = \frac{G \times F}{A \times T}$$

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## Methodology

The input of atmospheric matter is determined over 30 ± 2 days by exposing the glass collecting pots (domestic preserve jar, nominal diameter 9.5cm / capacity 1.5L / inside diameter of the glass opening 8.9cm / collecting area 62.2cm<sup>2</sup>) to the sample is then evaporated down and the dry residue is determined gravimetrically, the results being reported in mg/m<sup>2</sup>/day.

## Preparation

The collecting pots and lids were cleaned and rinsed thoroughly with distilled water, and allowed to dry in a dust free environment. The collecting pots were installed in the dust monitoring stands at the site, and the rubber seal was removed allowing full exposure to atmospheric deposition. Each dust jar was collected and re-sealed after the required exposure time had elapsed (30 ± 2 days). Prior to analysis at GeoTesting Ltd., the pots were stored away from any sources to limit the growth of micro-organisms. The dust contents of each pot was analysed gravimetrically as per the requirements of VDI 2119 (Measurement of Dustfall using Bergerhoff Instrument (Standard Method) German Institute.

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# Cultural Resource Development Services Ltd.

Archaeological and Geological Consultants

Unit 4, Dundrum Business Park,  
Dundrum Road, Dublin 14, Ireland.  
Telephone: 353 1 2968190  
Fax: 353 1 2968195  
email: crds@ucd.ie

## The Cultural Heritage Component

of the

## Environmental Impact Statement

for the

Reinstatement of an existing sand and gravel pit  
at

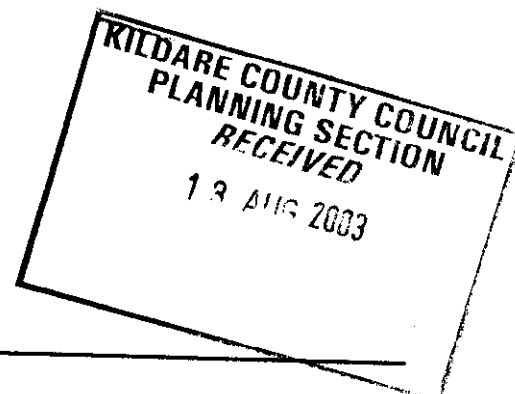
Kilmeage, Co. Kildare

on behalf of

Environment and Resource Management Ltd.

CRDS Ltd. Project Ref: 416

July 2003



V.A.T. Number: EI6330188P

Directors: Stephen Mandal B.A. (Mod.) Ph.D. M.I.A.I. P.Geo.  
Finola O'Carroll M.A. M.I.A.I.

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- Appendix 2. Recorded Archaeological Finds
- Appendix 3. Previous Excavations
- Appendix 4. Summary of Legislation Governing the Protection of Cultural Heritage in Ireland

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- Plate 2. View from southwest corner of site, facing north
- Plate 3. View from southwest corner of site towards ringfort (KD18:005), facing east
- Plate 4. View from east of site facing west

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**Project Team**

Stephen Mandal  
Aisling Collins

Report signed off by,

\_\_\_\_\_

Stephen Mandal

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## Executive Summary

At the request of Environment and Resource Management (ERML), Cultural Resource Development Services Ltd have undertaken the Cultural Heritage component of the Environmental Impact Assessment for the proposed reinstatement of an existing sand and gravel pit known as Gavin's Pit at Kilmeage, Co Kildare.

Gavin's Pit is located between two local public roads approximately 400m north of the village of Kilmeage, Co Kildare. It is accessed along a gravel surfaced private road from the public road to Prosperous. It is approximately 10 miles north of Newbridge town Co. Kildare. The approximate National Grid Reference at the site is 277600E, 223100N (see Fig 1).

The following report comprises the results of an intensive archaeological paper survey of the area of the proposed development and a field survey of the land on which the development is planned.

There are a total of six recorded monuments within the immediate surrounding area, these included two churches, two ringforts a castle site and an enclosure site. In addition, nine archaeological finds have been recorded within the immediate and surrounding area; these include stone axeheads, bronze axeheads, flint and an iron object.

The site has been extensively quarried in the past, such that if any archaeological features had existed on the site, they would have been destroyed by such quarrying. Therefore, as the potential impact of the proposed development will be negligible, no mitigation measures are required.

However, should the proposed development or related activity (including roads and services) extend into any of the adjacent previously undeveloped land (in particular in the area of the known recorded monuments in the area), then further advice should be sought from Dúchas, the Heritage Service, prior to any such works commencing.



## 1. Introduction

### 1.1. Site location

Kilmeage is located c. 16km north of Newbridge and c. 16km west of Naas (see Fig. 1).

### 1.2. Solid geology and soils

The site is located in an area of Carboniferous Age rocks. The bedrock under the site consists of Lower Carboniferous Age Limestone, a fine grained grey/blue calcareous fossiliferous rock. These rocks, which form much of the bedrock of the midlands of Ireland, represent the northward return of the sea at the end of the Devonian, c. 360 million years ago, owing to the opening of a new ocean to the south called the Palaeo-Tethys in what is now central Europe.

There is a substantial thickness of sand and gravel at the site, evidenced from the quarry (see Plates 1 – 4). These sediments are the result of glacial and glaciofluvial (glacial meltwater) deposits during the last Ice Age. Deposits such as these in this area are commonly over 30m in thickness, and in excess of 70m in the Curragh and Blessington areas. The soils of the area consist of grey brown podzolic, organo-mineral soils, brown earth, peats, podzols and gleys.

### 1.3. Characteristics of the proposed development

The proposed area for development is outlined in Fig. 2. The land holding is estimated at 6.5ha (including the short access road). The existing pit is ca. 5.4ha.

The pit is largely redundant at present. The pit is very deep in parts (25m+), has steep slopes and extends over an estimated area of 5.4ha.

At present the pit is not overlooked but there are dwellings close to its boundaries. There is a new housing development under construction on the western side of the pit. There are numerous residences (ca. 50) within a short distance of the site and the main commercial sector of the village of Kilmeage is located within 250 metres of the site boundary. Lands to the northwest, north and east are given to agricultural use.

The site requires restoration work as it represents a possible hazard immediately adjacent to the center of the village of Kilmeage. It is proposed to backfill the large void or pit with inert material and restore the site to its former status. The gentle grades should then allow an after use such as grazing and/or public amenity.

## 2. Baseline Survey

### 2.1. Introduction

For the purpose of setting the proposed development within its wider archaeological and cultural heritage landscape, and to assess the archaeological potential of the site, a comprehensive paper survey of all available archaeological, historical and cartographic sources was undertaken.

### 2.2. Recorded archaeological sites and monuments

The Record of Historic Sites and Monuments were consulted for the relevant parts of Co. Kildare. This is a list of archaeological sites known to the National Monuments Service. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, OPW

Archaeological Survey notes and other relevant publications. These were studied in the Sites and Monuments Records Office. All sites within a radius of c. 1km of the proposed development were identified. There are a total of six sites recorded. These monuments are listed in Appendix 1.

### **2.3. Recorded archaeological finds**

The topographical files in the National Museum of Ireland were consulted to determine if any archaeological artifacts had been recorded from the area. This is the National archive of all known finds recorded by the National Museum. It relates primarily to artifacts but also includes references to monuments and has a unique archive of records of previous excavations. Other published catalogues of prehistoric material were also studied: Raftery (1983 - Iron Age antiquities), Eogan (1965; 1993; 1994 - bronze swords, Bronze Age hoards and goldwork), Harbison (1968; 1969a; 1969b - bronze axes, halberds and daggers) and the Irish Stone Axe Project Database (Archaeology Dept., U.C.D.). All townlands within the study area were assessed. There is a total of six finds recorded. A list of recorded finds from the area is given in Appendix 2.

### **2.4. Cartographic sources**

Reference to cartographic sources is important in tracing land use development within the development area as well as providing important topographical information on sites and areas of archaeological potential. Primary cartographic sources consulted consisted of the Ordnance Survey 6" maps, first and later editions (T.C.D. Map Library).

### **2.5. Previous Excavations**

The excavation bulletin website ([www.excavations.ie](http://www.excavations.ie)) was consulted to identify any previous excavations that may have been carried out within the study area. This database contains summary accounts of all the excavations carried out in Ireland from 1985 to 2001. A total of three excavations were carried out in the area. Details of previous excavations are listed in Appendix 3.

### **2.6. Historical research**

Primary historical sources consulted included: Bronze Age cemeteries in Kildare (Mount C), The long stone Punchestown (Leask), Ireland in Prehistory. England (Herity & Eogan) and The Hayes Index amongst other publications.

## **3. Archaeological and Historical Background**

### **3.1. Prehistory (c. 4000 BC – AD 500)**

There have been three stone axeheads and a flint fragment recovered from the study area in the townlands of Mylerstown and Robertstown (see Appendix 2). Polished stone axeheads are the most characteristic object type associated with the Neolithic period in Ireland.

Around 2500BC, metal started to replace stone as the basic material used in the manufacture of almost all tools and implements; a bronze age socketed axehead was recorded within the study area at Robertstown (Appendix 2). The Bronze Age period in Kildare is also represented by Early Bronze Age burials, dating to the period between c. 2300- 1500 cal BC. There are c. 30 burials in Kildare that date to this period. They are pit burials and stone-built cists containing inhumations and cremations associated with food vessel pottery and cinerary urns. They frequently occur in cemeteries and it is suggested that single occurrences may represent ploughed out cemeteries (Mount, 1993). The majority of these lie to the east of the study area, in the foothills of the Wicklow mountains. Five Early Bronze Age cemeteries were uncovered in Kildare and Carlow between 1933-1959, with a minimum of 22 graves containing a minimum of 34 individuals.

There is little in the way of documentary evidence for the close of this period relating to Kildare or its inhabitants. However limited records do survive. There is an occurrence documented in the Book of Leinster in a work entitled 'The Seige of Howth', involving the king and queen of Leinster in the 1<sup>st</sup> century AD. The tale is of the death of the king in battle and the subsequent death of his queen, in grief. Mesgegra is the king in question, and Buan, his queen, documented as residing in Naas.

### 3.2. *Early-medieval Period (c. AD 500 – 1170)*

As for most of Ireland, early medieval settlement evidence in Co. Kildare is characterized by the presence of ringforts. Leinster is one of the lowest density areas of ringfort distribution. This may not be truly reflective of activity in the area at the period of most intensive ringfort construction, from c. 400-700AD.

Ringforts or raths, as they are also known, in the east of the country, are typically *univallate* circular enclosures measuring an average 30m in diameter. The enclosing element is typically an earthen bank and external ditch, usually c. 3m wide. Occasionally, there is more than one enclosing element, forming *multivallate* ringforts. The ringfort is probably the most conspicuous and certainly the most prolific type of monument in the Irish countryside. They are not purely of a military nature, with the majority being the enclosed farmstead of the free farmers of the Early Christian period. The origins of the ringfort appear to be from the Iron Age or Late Bronze Age but the majority are Early Christian in date c. AD 400 – 1200. There are two ringforts in Kilmeage. Enclosures are enclosed areas, which are still extant, but which do not fall easily within the classification of other known monument types such as ringforts. It also covers sites discovered by aerial photography. It is impossible to define their exact nature. There is one enclosure in Kilmeage.

Other significant early medieval activity in Kildare is represented by the proliferation of early Christian activity in the form of churches and monastic settlements. The name Kildare is derived from Cell Dara – the church of the oak. Kildare town was established on the site of the 5<sup>th</sup> century nunnery founded by St Brigid. Kildare lies c.16km south of the study area. Elsewhere in the county, there is a 5<sup>th</sup> century ecclesiastical establishment at Monasterevin, founded by St Evin.

The arrival of Christianity was the catalyst for a major change in the landscape in Ireland. The earlier landscape of forts and fields was slowly replaced by nucleated settlements that began with the establishment of monasteries (and nunneries) in places like Kildare town. Kildare was in ancient times one of the most important ecclesiastical settlements in Ireland. It has two cathedrals, but is comparatively small place. The tradition was such that monastic settlements were areas of sanctuary and thus attracted a population which in turn gave way to the tradition of fairs being held at Early Christian centers. They were proto-urban settlements (Swift 1998). There are two church sites within the general study area, one of them at Rathernan which appears to be an 18<sup>th</sup> century building, and the second church site; a grass covered mound in the townland of Ballintine represents the site of a church of which its date is unknown.

There are no recorded archaeological finds of medieval date within the study area but a medieval potsherd has been recorded in the surrounding vicinity of the study area, this was medieval glazed ware and was found in the Townland of Jigginstown.

### 3.3. *Late medieval and post medieval period (c. AD 1170 - 1900)*

The Anglo- Norman invasion of Ireland in 1169 gave rise to the establishment of a string of frontier defensive fortifications along the boundary of what came to be known as the Pale.

The former *tuath* of Offelan is made up of the Anglo- Norman *cantreds* of North and South Salt, Ikeathy, Oughteranny, Clane and North and South Naas.

Naas is located c. 16km east of the proposed development. When the Normans arrived the Barony of Naas was granted by Strongbow to Maurice FitzGerald. The grant was confirmed to his son, William FitzMaurice, by Henry II in 1177. Under the Anglo-Normans many changes were made. The parish church, originally dedicated to St Patrick or the local St Corban, was rebuilt and re-dedicated to St David, the Welsh patron saint.

King Henry IV granted Naas its first charter as a Corporation in 1409. Four years later, in 1413 King Henry V granted the corporation power to collect tolls at all the entrances to the town. A new charter was granted by Queen Elizabeth I in 1568, adding a Sovereign to the Corporation. Naas was granted further charters by James I in 1609, Charles I in 1628, and by Charles II in 1671. These charters governed the town until 1840 when Act of Parliament dissolved the Corporation.

Between 1840 the town was controlled by a Grand Jury; it had Town Commissioners from 1854 to 1900 and since then has been under the administration of the Urban District Council.

#### 4. Field Assessment

##### 4.1 Survey

The site visit was undertaken in February 2003 in sunny weather. The perimeter of the site was walked and the adjacent fields assessed. The majority of the site has been extensively quarried, with a narrow terrace remaining around the perimeter at original ground level. The terrace ranges from greater than 30m to less than 5m in width. The quarry works reveal top and subsoil to be c. 25-40cm in depth, overlying sand and gravels. Nothing of archaeological interest was noted on the ground around the perimeter of the site.

The lands to the west and south of the site consist of individual and grouped private dwellings. To the north and east of the site the lands consist of fields in open pasture. The pond shown on Fig. 2 appears to be man made; it is probably a water hole for livestock.

The site commands very good views of the surrounding countryside (see Plates 1 – 4). Kilmeage church is visible from the site (see Plate 1). No visible trace remains of Kilmeage castle (RMP No. KE018:003) and the ringfort (RMP No. KE018:004) is not visible from the site. The ringfort (RMP No. KE018:005) is visible from portions of the southwest and east sides of the site perimeter (see Plate 3), defined by a tree ring and bank.

#### 5. Potential Impact of the Proposed Development

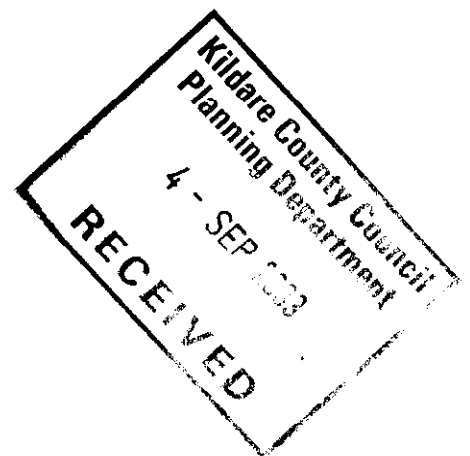
The development site has been completely quarried in the past to below the level of potential archaeological remains. There were a total of six recorded monuments within the surrounding area, these included two churches (KD018:001 & KD018:006), two ringforts (KD018:004 & KD018:004) a castle site (KD018:003) and an enclosure site (KD018:002), but these will not be directly impacted on by the proposed development. No previously unrecorded archaeological features were noted during field survey. As such, the impact of the proposed development on the cultural heritage of the area will be negligible.



## 6 Recommended Avoidance, Remedial or Reductive Measures

As the potential impact of the proposed development will be negligible, no mitigation measures are required. However, should the proposed development or related activity (including service roadways) extend into any of the adjacent previously undeveloped land (in particular in the area of the known recorded monuments in the area), then further advise should be sought from Dúchas, the Heritage Service, prior to any such works commencing.

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- Leask, H,G. The long stone Punchestown, JRSAI, Vol LXVII, 1937
- Mount, C. 1998. Bronze Age cemeteries in Kildare. PRIA Vol 98, pg 25
- Raftery, B, 1983. A catalogue of Irish Iron Age antiquities. Marburg.
- Sites and Monuments Record. National Monuments Division: Dúchas.
- The Irish Stone Axe Project Database. Department of Archaeology: University College Dublin.

### Appendix 1 Recorded Archaeological Sites and Monuments

The recorded archaeological sites within 1km of the proposed development are listed below, all noted in the Sites and Monuments Records for Kildare. The monuments are listed in a standard format as follows:

#### List of sites

**SMR No.:** 018:002  
**Sh/PI/Tr:** 18/1/2  
**Townland:** Ballintine  
**National Grid:** 27724/22394  
**Description:** Enclosure - circular

Possible earthwork, it appears to be a natural hillock, very much overgrown. No other features of similar type nearby. However as it is shown as an antiquity on the OS 1837 MAP, There may have been some tradition associated with the feature.

**SMR No.:** 018:001  
**Sh/PI/Tr:** 18/1/2  
**Townland:** Ballintine  
**National Grid:** 27722/22427  
**Description:** Church site

Hashers on map beside graveyard seem to indicate earthwork on hill top – this is a quarry. Its on top of high ridge with excellent views over undulating ground and surrounding top. Good tillage and pastureland. A grass covered mound represents site of a church.

**SMR No.:** 018:003  
**Sh/PI/Tr:** 18/1/6  
**Townland:** Kilmeage  
**National Grid:** 27855/22356  
**Description:** Castle site

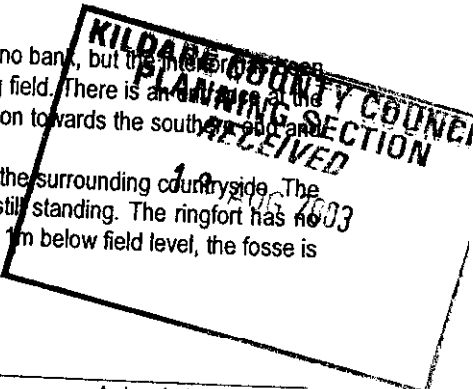
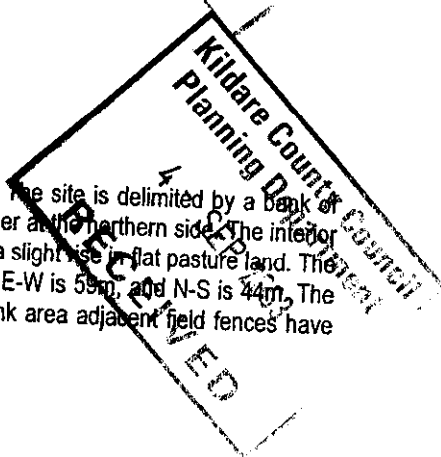
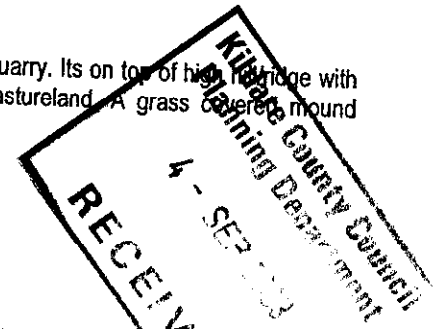
There's a reference to the Fitzgerald castle Kilmeage at the foot of the hill of Allen in 1553. At the base of the south facing slope – adjacent to wet marshy area to the south – damp pasturland. No standing parts of the castle remain but nettle covered piles of rubble and sandstone abound. Huge sheep sheds have been constructed adjacent at west.

**SMR No.:** 018:004  
**Sh/PI/Tr:** 18/2/4  
**Townland:** Kilmeage  
**National Grid:** 27859/22411  
**Description:** Ringfort

A roughly oval shaped ringfort – the northern and eastern sides being almost straight. The site is delimited by a bank of earth and stone and an outer fosse. There is an entrance at the western side and another at the northern side. The interior is flat, sloping slightly from west to east with a slight rise in the center. The ringfort is on a slight rise in flat pasture land. The site is enclosed by a hedge making the interior a small field on paddock. The diameter E-W is 59m, and N-S is 44m. The site is now visible as a low rise c. 60cm surrounded by a cropmark of thistles. The bank area adjacent field fences have been flattened and opened out.

**SMR No.:** 018:005  
**Sh/PI/Tr:** 18/2/1  
**Townland:** Grangeclare east  
**National Grid:** 27894/22455  
**Description:** Ringfort

A small ringfort, roughly circular in shape. The earthwork is delimited by a fosse. There is no bank, but the interior is enbanked, giving the area immediately inside the fosse added height over the surrounding field. There is an entrance at the west side – the interior of the ringfort slopes from west to east. There is a slight depression towards the southern side and another slight depression at the eastern side. The ringfort is on a hill top in well drained pasture land – and has a commanding view of the surrounding countryside. The diameter E-W is 36m. Its on the edge of a slightly undulating ridge – the monument is still standing. The ringfort has no visible trace of a bank – The central area is 1.5m high along the base of the fosse which is 1m below field level, the fosse is v shaped C.10M across top.



**List of sites (continued)**

**SMR No.:** 018:006  
**Sh/PI/Tr:** 18/2/4  
**Townland:** Ratheman  
**National Grid:** 27881/22356  
**Description:** Church

Portion of west gable(min length 5.5m) of red sandstone – mortared and roughly coursed. Corner stones of S.W corner robbed. NW corner missing entirely. In graveyard with few head stones – Overgrown – Headstones are very worn but seems at least to be c. 18<sup>th</sup> century

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## Appendix 2 Archaeological Finds

The recorded archaeological finds in the vicinity of the site are listed below, all noted in the National Museum of Ireland files, Kildare Street, Dublin 2, in local journals, or in other published catalogues of prehistoric material: Raftery (1983), Eogan (1965; 1983; 1994), Harbison (1968; 1969a; 1969b) and the Irish Stone Axe Project Database. The following townlands were assessed;

Ballintine, Coolaght, Grangeclare, Killeagh, Kilmeage, Mylerstown, Plukestown, Rathernan, Robertstown and Russellstown.

Of these, archaeological finds have been recorded from Mylerstown and Robertstown

### List of finds

**Reg No.** 1958:118  
**Townland:** Mylerstown  
**Parish:** Kilashee  
**Barony:** Naas South  
**Find:** Polisher stone axe head  
 This was found in 1956 at Mylerstown and it was purchased from a Mr Jeremiah Counihan.

**Reg No.** 11939:508  
**Townland:** Mylerstown  
**Parish:** Mylerstown  
**Barony:** Carbury  
**Find:** Flint fragment  
 This was from the Hewson collection.

**Reg No.** 1A 103/62  
**Townland:** Robertstown  
**Parish:** Kilmeage  
**Barony:** Connell  
**Find:** Socketed bronze axehead.  
 This was on loan for recording by Thomas Hendy. This is a socketed bronze axehead in fairly good condition, although now much pock marked and with a small hole due to excessive erosion, very slightly splayed cutting edge – rectangular socket and socket mouth – around the socket mouth are three ridges or mouldings. Below these, on one side, is a large loop. These are three low, wide ridges across the bottom of the interior of the socket. The length is 6.5cm and the width at the cutting edge is 3.7cm.

**Reg No.** 1979:13  
**Townland:** Jigginstown  
**Parish:** Naas  
**Barony:** -  
**Find:** Potsherd – Medieval glazed – donated to museum – the MNI file is empty.

**Reg No.** IA/211/90  
**Townland:** -  
**Parish:** -  
**Barony:** -  
**Find:** Axehead  
 An axehead found on the farm of Mr Herbert, Robertstown, Co. Kildare. Perhaps a whetstone for sharpening tools, a large polished stone axehead which dates to the Neolithic or Late Stone Age between 4000-2000BC

**Reg No.** 1936:3451  
**Townland:** Mylerstown  
**Parish:** Harrisown  
**Barony:** Offaly south  
**Find:** Large stone axe  
 Found at Rathmuck- dug up from 2ft under the surface

**List of finds (continued)**

**Reg No:** 245  
**Findplace:** Dun Ailinne  
**Reference:** Raftery.B (1983 - Iron Age antiquities)  
**Find:** A reference to an iron antiquity

**Reg No:** 22(449), 39(851), 45(1256), 64(1986).  
**Findplace:** Hill of Allen  
**Reference:** Harbison. P (1969 -The axes of the early Bronze Age in Ireland),  
**Find:** A reference to BA antiquities

**Reg No:** 14(77).  
**Findplace:** Hill of Allen  
**Reference:** Harbison. P (1969 – The daggers and the Halberds of the Early Bronze Age in Ireland)  
**Find:** A reference to dagger/halberd

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### Appendix 3 Previous excavations

Previously published archaeological excavations in the area from 1969 to 2001 ([www.excavations.ie](http://www.excavations.ie)) are summarised below. These are listed in a standardised format as follows:

#### List of excavations

**Kildare**  
**1999:398**  
**Kilmeage**  
Vicinity of church  
**N775231**  
**99E0625**

The development site is to the north-west of the Church of Ireland church in Kilmeage village. The site slopes steeply upwards, eastwards from the Kilmeage-Allenwood road, and is bounded on the north-west side by the Kilmeage-Robertstown road and on the south-east side by a large sand and gravel quarry. There are good views westwards to the Hill of Allen and southwards towards the Wicklow Mountains. The major portion of the site at the back of the existing bungalow is currently under grass. The portion of the site fronting the Allenwood road is overgrown with vegetation and may have been quarried out in the past, as suggested by a steep scarp downwards from the boundary fence of the existing bungalow.

It is reputed that the church was built on the site of an earlier church, although the site is not marked on the Sites and Monuments Record for County Kildare. The village of Kilmeage was laid out in the 1830s. There is a tradition that a large quantity of human bone was found when the houses southwest of the church and across the road were being built, suggesting that a graveyard originally surrounded the church. There is also a tradition that the northern and western limits of the original graveyard extended further outwards than today's boundary.

Ten trenches tested this development site. Four of them were in the vicinity of the graveyard, to establish the presence/absence of burials and/or an early enclosing feature around the church. Such remains were not found. The scarcity of human bone was noteworthy, as disturbed human bone is generally found in the vicinity of graveyards. Very few fragments were found in these trenches.

The other trenches tested the wider development area. Two pit-like features were exposed. It was suggested that one of them (in Trench 5) might have been a hand-dug test-pit for quarrying purposes. The function and date of the other, in Trench 10, were not clear. Ash had been thrown into it, and it may have had some kind of domestic function.

No human burials were exposed. There was no evidence for the remains of an enclosing ditch associated with an earlier church on the site.

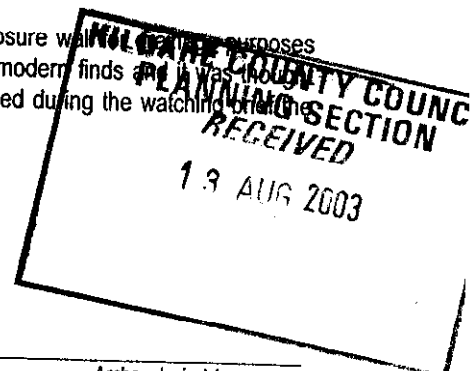
Rosanne Meenan, Roes town, Drummer, Co. Meath.

**Kildare**  
**1992:110**  
**'Resurexit', Rathernan**  
Ecclesiastical site  
**N788235**

A watching brief was carried out on the excavation of trenches for an extension to the meeting hall 'Resurexit' on 13-14 May 1992. The extension was carried out in the rear garden and field. The site was adjacent to a large ecclesiastical enclosure containing a graveyard and the ruins of a sandstone church and the trenches were observed with a view to any possible extension of the ecclesiastical settlement beyond the dry stonewall which encircled it. The trenches in the rear garden revealed a deep deposit of modern garden soil overlying 0.32m of mid-brown sandy clay of uncertain date. The underlying boulder clay was formed by a red-brown loam. The sandy clay did not reveal archaeological finds.

Several trenches were cut in the field to the rear of the garden and adjacent to the enclosure wall for purposes revealing a shallow fosse 0.5m deep and 3m wide. The fosse was filled, however, with modern finds and it was thought likely that the fosse had been cut recently. Since no archaeological material was recovered during the watching brief the extension was allowed to proceed.

Neil O'Flanagan, Archaeological Development Services Ltd, Pigeon House Harbour, D.4.



**List of excavations (continued)****Kildare****1999:419****Prosperous – Robertstown Water Improvement Scheme**

Within zones of archaeological potential

**SMR 13:7-10, 13:13, 13:14, 13:16, 13:17****99E0085**

An archaeological assessment was conducted in March 1999 on a section of the Prosperous to Robertstown Water Improvement Scheme, which bisected Mulhall's Fort (SMR 13:17) along an existing road. The southern half of the fort and a segment of the northern portion remained extant, while the road and two houses and gardens had greatly disturbed its interior. The assessment was conducted before further disturbance, as it was anticipated that deeper archaeological strata might survive below the road. The fort itself measures 80m in maximum diameter.

Two trenches were excavated along the proposed pipeline and road verge to a depth of 1.4m. Two body sherds of 19th-century ceramic were recovered from one trench amongst disturbed boulder clay. The second trench crossed the western extent of the fort. No features or artefacts associated with the fort were uncovered. That the ditch was not exposed would suggest that the area had been greatly disturbed by the road construction. Consequently, it was recommended that archaeological monitoring of the route would be sufficient to identify any further features of archaeological significance along the proposed route.

A single trench, 1m wide, was excavated by machine along the route of the pipeline to accommodate a single water main and four telecom ducts within the road and verge to an average depth of 1.4m.

A 2km stretch of the scheme, between Prosperous and Blackwood crossroads, was monitored between 8 November 1999 and 30 January 2000. The natural glacial sand and gravel were exposed directly below the tarmac and hardcore layer of the roadway at an average depth of 0.3m. No archaeological features or deposits were uncovered.

The remainder of the scheme was monitored from 8 January to 15 March 2000 from Blackwood crossroads to Mulhall's Fort. A single trench 1m wide and up to 1.5m deep was excavated along the road and the road margin. The tarmac and hardcore extended to a depth of 0.3m and overlay the natural glacial sand, gravel and boulder clay. The final stretch of the pipeline between Mulhall's Fort and Robertstown was completed on 15 March 2000. Monitoring of this stretch revealed that the tarmac and hardcore deposits of the bog road extended to a depth of 0.25m and overlay an extensive layer of natural, black peat. This extended to an average depth of 1.4m and overlay the natural, grey, marly clay. No archaeological features were exposed, and no finds were recovered.

The excavation of the trench close to the various recorded sites along the route and through Mulhall's Fort did not reveal any archaeological stratigraphy. Similarly, the excavation of the pipe-trench across the dry canal bed did not reveal any features, deposits or finds.

Ian Russell and Donald Murphy, Archaeological Consultancy Services Ltd, 15 Trinity Street, Drogheda, Co. Louth.



**Appendix 4**  
**Summary of Legislation Governing the Protection of Cultural Heritage in Ireland**  
 (Produced by C.R.D.S. Ltd)

**The National Monuments Acts 1930 to 1994**

The National Monuments Acts, 1930 to 1994 provide a specific legislative basis for the protection of archaeological monuments and areas and archaeological objects. The Minister of Arts, Culture and the Gaeltacht (now the Minister of Arts, Heritage, Gaeltacht and the Islands) is required to establish and maintain both a 'Register of Monuments and Places' and 'Record of Historic Monuments' under the terms of the 1987 and 1994 Amendments Acts respectively.

The 'Record of Monuments and Places' is meant to contain a list of places where the Minister believes there are monuments. The 'Register of Historic Monuments' is meant to contain a list of historic monuments and archaeological areas which are known and which in his/her opinion should be entered. In the case of the 'Record of Monuments and Places' the record shall consist of a list of monuments and such places, and maps showing them, for each county in the State.

Under Section 1 of the 1987 Act all monuments dating to before AD 1700 are automatically defined as 'historic monuments'. Historic monuments may also be of 'such later date as the Minister may appoint by regulations'. Under Section 12 of the 1994 Act all monuments listed on the 'Record of Monuments and Places' are given a minimum level of protection in the form of a requirement to give two months notice in writing to the Minister of intention to interfere.

A national monument, as defined in Section 2 of the 1930 Act, may also include, as provided for in Section 11 of the 1987 Act, 'a group of buildings, structures or erections' and/or 'any place comprising the remains or traces of buildings, structure or erection'. The 1930 definition also includes the 'site of the monument and such portion of land adjoining such site as may be required to fence, cover in or otherwise preserve from injury the monument or to preserve the amenities thereof'.

'Archaeological areas' are defined under Section 1 of the 1987 Act as 'areas which the Minister considers to be of archaeological importance but not including the area of an historic monument entered in the Register'. Notification has to be sent to the owner that such a historic monument or area has been entered in the Register.

Other forms of protection include a 'preservation order' and a 'temporary preservation order' instituted under section 8 of the 1930 Act and Section 4 of the 1954 Act respectively. A 'Preservation Order' may be made if the Minister is of the opinion that a monument is 'in danger of being or is actually being destroyed, injured or removed, or is falling into decay through neglect' while a 'Temporary Preservation Order', lasting for a period of six months, may be made if the Minister is of the opinion that a national monument is 'in immediate danger of injury or destruction'.

The Minister may also, under Section 9 of the 1930 Act, appoint her/himself 'guardian' of a national monument (obliging her/him to maintain it) and thus make it an offence 'to demolish or remove wholly or in part or to disfigure, deface or alter, or in any manner injure or interfere' with the national monument 'or to excavate, dig, plough or otherwise disturb the ground within, around or in proximity to any such national monument' without the consent of the Minister.

**Heritage Act 1995**

The Heritage Act established a statutory 'Heritage Council', the functions of which include proposing policies and priorities for the identification, protection and preservation of the national heritage. Section 2 of the Act includes in its definition of 'archaeology' the term 'landscape' and 'landscape' is defined as including 'areas, sites, vistas and features of significant scenic, archaeological, geological, historical, ecological or other scientific interest.'

**Local Government (Planning and Development) Acts 1963 to 1993**

Under the Local Government Planning and Development Acts 1963 to 1964 the use of land for agriculture (including turbarry) or forestry (including afforestation) are exempted by statute from the provisions therein. Furthermore other activities such as river dredging and land reclamation can be exempted by regulation.

However, in the case of those activities exempted by regulation, the exemption ceases if the activity consists of or comprises 'the excavation, alteration or demolition of caves, sites, features or other objects of archaeological ... interest the preservation of which is an objective for the development plan for the area in which the development is proposed' or if it is a class of activity scheduled in the Environmental Impact Assessment (EIA) Regulations.

**The Environmental Impact Assessment (EIA) Directive and Regulations**

The EIA Regulations of 1989 were made under the European Communities Act 1972, for the purpose of giving effect to the European Communities (now EU) Environmental Impact Assessment Directive. Environmental Impact Statements (EISs) are required to contain a description of the likely significant effects, direct and indirect, on the environment of a

development, explained by its possible impact on, inter alia, the cultural heritage and where significant adverse effects are identified a description of the measures envisaged in order to avoid reduce or remedy those effects.

**The Forestry Act 1988**

The Forestry Act 1988, established Coillte Toeranta as a semi-state company. Under the Act, it is a general duty of the company to have due regard to the environmental and amenity consequences of its operations.

**The Turf Development Acts 1946 to 1990**

The Turf Development Acts provide the statutory basis for Bord Na Móna and its activities; In performance and exercise of its duties Bord Na Móna may 'ensure that all its activities are conducted in such a manner as to afford appropriate protection for the environment both locally and nationally'.

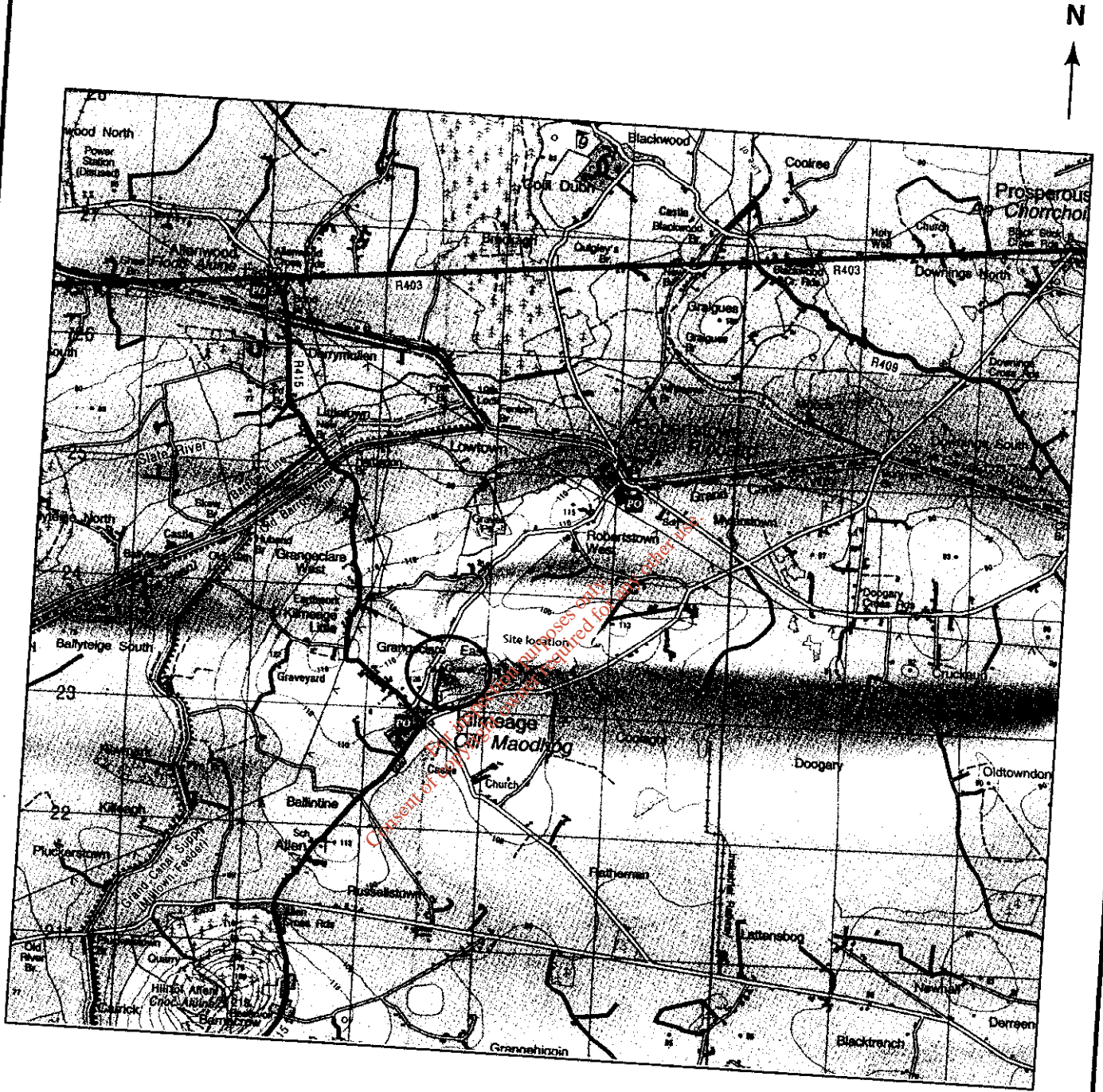
**The Roads Act 1993**

The Roads Act 1993 provides for local authorities to be roads authorities and sets out the functions of the National Roads Authority. It requires the roads authorities to prepare an EIS for any proposed road development that fall within the parameters set out in the Roads Regulation 1994 or if the Minister for the Environment considers a particular road development to have significant effects on the environment.

**National Parks and Heritage Areas Bill**

The Bill, if enacted would allow the Minister for Arts, Culture and the Gaeltacht to enter into management agreements with landowners and to acquire land where this would be desirable for the proper exercise of his/her functions under the Act. Where land is owned by him/her or is subject to a management agreement he/she will be able to designate it as a National Historic Park provided such land contains historic heritage, i.e. historic monuments, archaeological areas and monuments of national importance.

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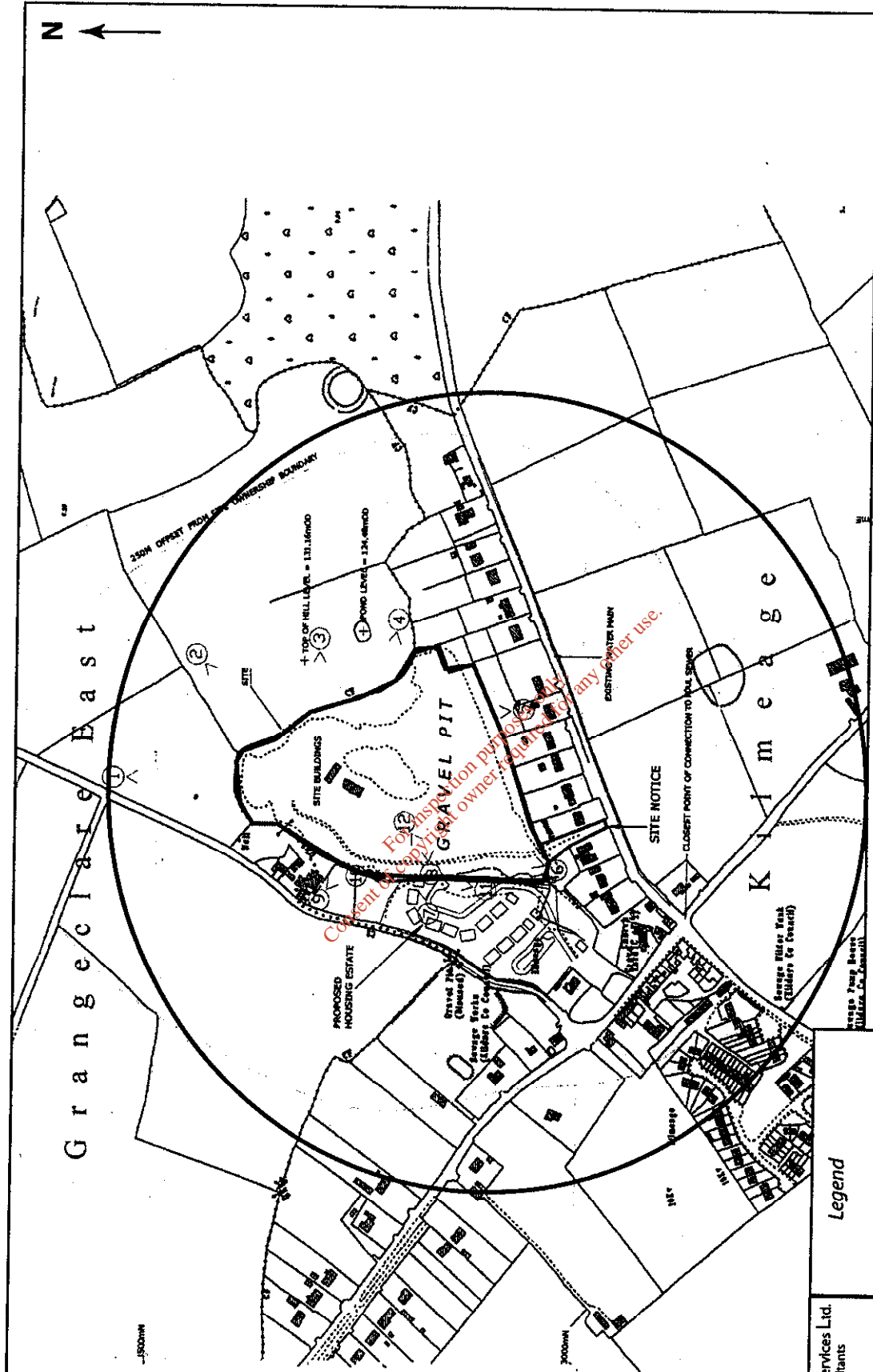



Unit 4  
Dundrum Business Park,  
Dublin 14.  
Tel: +353 1 2968190-3  
Fax: +353 1 2968195  
email: info@crds.ie

Figure No: 1  
Title: Discovery 49  
Job No: 416

Client: ERM Ltd.  
Drawn By: VP  
Date: 10-7-03

Figure 1. The Discovery Series map of the site No. 49 showing the site location.



 <p><b>Cultural Resource Development Services Ltd.</b> Archaeological &amp; Geological Consultants</p> <p>Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie</p>	<p>Client: ERM Ltd. Drawn By: AgC Date: June 2003</p>
	<p>Figure No.: 2 Title: Development Plan Job No.: 416</p>

**Legend**




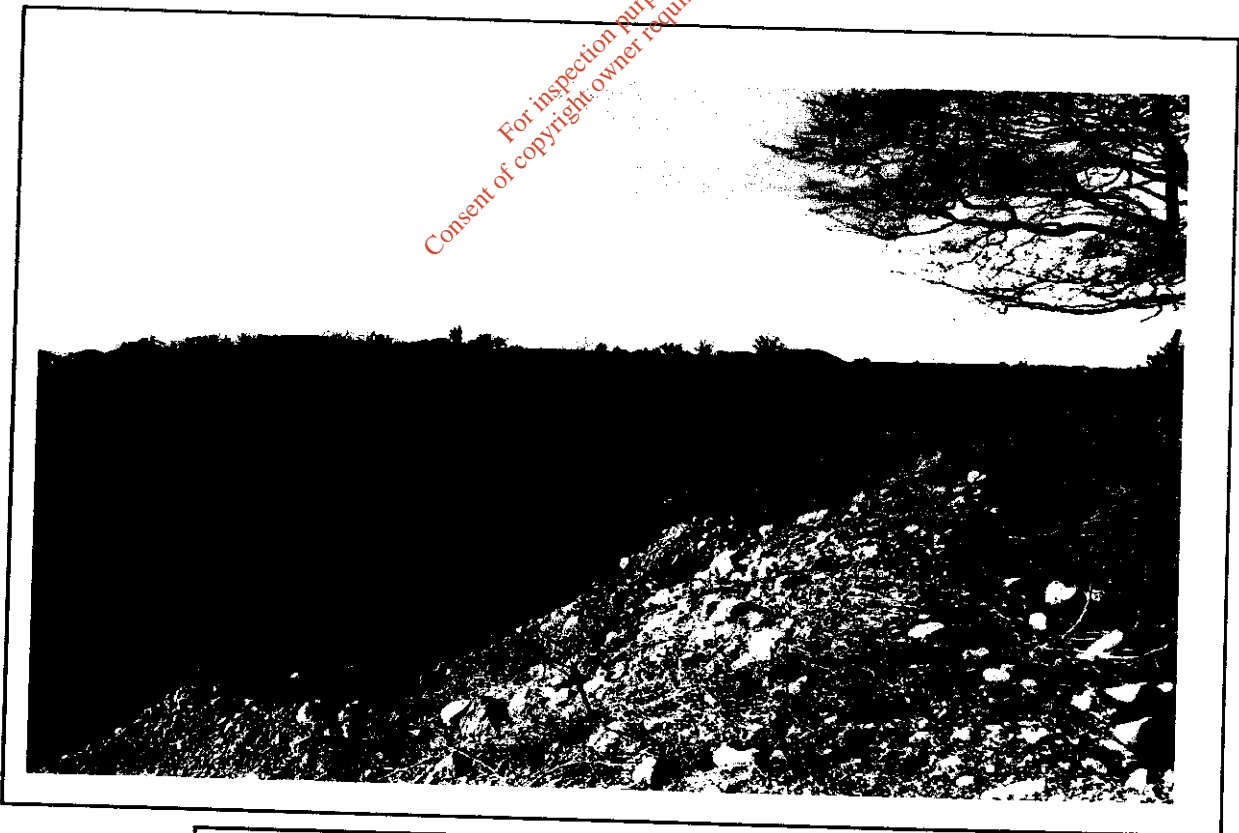
-  Buffer zone
-  Site outline


Figure 2 The plan of the proposed development and buffer zone.






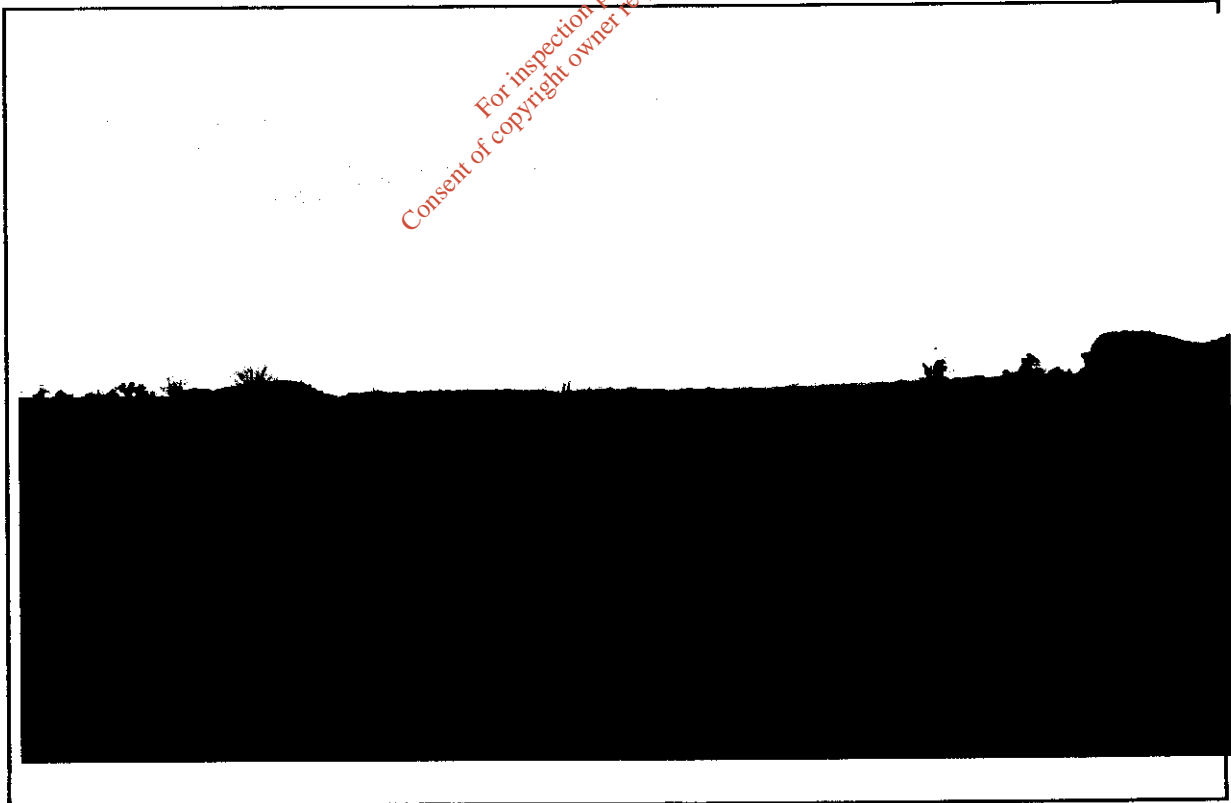
<b>Cultural Resource Development Services Ltd.</b> Archaeological & Geological Consultants		Plate No: 1 Title: Kilmagee Job No: 416	Client: ERM Ltd Photo By: SM Date: June 2003
	Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	View of Kilmagee church from the southeast corner of the site facing west.	




<b>Cultural Resource Development Services Ltd.</b> Archaeological & Geological Consultants		Plate No: 2 Title: Kilmagee Job No: 416	Client: ERM Ltd. Photo By: SM Date: June 2003
	Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	View from the southeast corner of the site, facing north.	



<b>Cultural Resource Development Services Ltd.</b> Archaeological & Geological Consultants  Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	Plate No: 3 Title: Kilmeage Job No: 416	Client: ERM Ltd Photo By: SM Date: June 2003
	View from southeast corner of site towards ringfort (KD18:005), facing east.	



<b>Cultural Resource Development Services Ltd.</b> Archaeological & Geological Consultants  Unit 4 Dundrum Business Park, Dublin 14. Tel: +353 1 2968190-3 Fax: +353 1 2968195 email: info@crds.ie	Plate No: 4 Title: Kilmeage Job No: 416	Client: ERM Ltd. Photo By: Date: June 2003
	View from east of site facing west.	





No. 3 Tara Court  
 Naas, Co. Kildare  
 tel 045-874411, fax 045-874549

## Environment & Resource Management Ltd

### Sampling Log

**Site Location:** Kilmeage **Location ID:** TP1  
**Project No.:** 03.082 **Sampler:** AS  
**Date:** 29/05/2003 **Stickup (m):** 1.268m  
**TOC Elevation (mOD):** 98.909 **Well Depth:** 4.54mBTOC  
**Head:** 0.5m **Well ID:** 100mm  
**Volume in Well:** 4l **Volume Purged:** 10l  
**Rope Type:** - **Bailer Type:** Pump  
**Decon Procedure:** Pump decontaminated between purgings

### Field Parameters

**Colour:** Slightly cloudy **Odour:** -  
**Temperature:** 13.0 °C **Conductivity:** 582 µS/cm  
**pH:** 6.98

Kildare County Council  
 Planning Department  
 4 - SEP 2003  
**RECEIVED**

Analysis Requested	Container Type/Volume	Preserved	Comments
	1l Plastic	-	
	0.5l Amber Glass	-	
	1 no Vial	-	
	250ml Plastic	H <sub>2</sub> SO <sub>4</sub>	
			POOR RECHARGE

\*\* Note 5cm ID = 1.962 litres/m



No. 3 Tara Court  
 Naas, Co. Kildare  
 tel 045-874411, fax 045-874549

## Environment & Resource Management Ltd

### Sampling Log

**Site Location:** Kilmeage **Location ID:** TP2  
**Project No.:** 03.082 **Sampler:** AS  
**Date:** 29/05/2003 **Stickup (m):** 0.523  
**TOC Elevation (mOD):** 99.178 **Well Depth:** 2.81mBTOC  
**Head:** 1.43m **Well ID:** 100mm  
**Volume in Well:** 11l **Volume Purged:** 90l  
**Rope Type:** - **Bailer Type:** Pump  
**Decon Procedure:** Pump decontaminated between purgings

### Field Parameters

**Colour:** Clear **Odour:** None  
**Temperature:** 11.7 °C **Conductivity:** 762 µS/cm  
**pH:** 7.07

Analysis Requested	Container Type/Volume	Preserved	Comments
	1l Plastic	-	
	0.5l Amber Glass	-	
	1 no Vial	-	
	250ml Plastic	H <sub>2</sub> SO <sub>4</sub>	

\*\* Note 5cm ID = 1.962 litres/m



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 Naas, Co. Kildare  
 tel 045-874411, fax 045-874549

## Environment & Resource Management Ltd

<b>Site Location:</b> _____	Kilmeage	<b>Location ID:</b> _____	TP3
<b>Project No.:</b> _____	03.082	<b>Sampler:</b> _____	AS
<b>Date:</b> _____	29/05/2003	<b>Stickup (m):</b> _____	1.142m
<b>TOC Elevation (mOD):</b> _____	96.89	<b>Well Depth:</b> _____	3.14mBTOC
<b>Head:</b> _____	1.29m	<b>Well ID:</b> _____	100mm
<b>Volume in Well:</b> _____	10l	<b>Volume Purged:</b> _____	90l
<b>Rope Type:</b> _____	-	<b>Bailer Type:</b> _____	Pump
<b>Decon Procedure:</b> Pump decontaminated between purgings			

### Field Parameters

**Colour:** \_\_\_\_\_ Clear \_\_\_\_\_ **Odour:** \_\_\_\_\_ None \_\_\_\_\_

**Temperature:** \_\_\_\_\_ 13.0 °C \_\_\_\_\_ **Conductivity:** \_\_\_\_\_ 540 µS/cm \_\_\_\_\_

**pH:** \_\_\_\_\_ 7.04 \_\_\_\_\_

Analysis Requested	Container Type/Volume	Preserved	Comments
	1l Plastic	-	
	0.5l Amber Glass	-	
	1 no Vial	-	
	250ml Plastic	H <sub>2</sub> SO <sub>4</sub>	

\*\* Note 5cm ID = 1.962 litres/m



No. 3 Tara Court  
 Naas, Co. Kildare  
 tel 045-874411, fax 045-874549

## Environment & Resource Management Ltd

### SAMPLE SHEET

<b>Site Location:</b> Kilmeage	<b>Location ID:</b> TP4
<b>Project No.:</b> 03.082	<b>Sampler:</b> AS
<b>Date:</b> 29/05/2003	<b>Stickup (m):</b> 1.276
<b>TOC Elevation (mOD):</b> 98.666	<b>Well Depth:</b> 4.5mBTOC
<b>Head:</b> 3.8m	<b>Well ID:</b> 100mm
<b>Volume in Well:</b> 5.5l	<b>Volume Purged:</b> 90l
<b>Rope Type:</b> -	<b>Bailer Type:</b> Pump
<b>Decon Procedure:</b> Pump decontaminated between purgings	

### Field Parameters

<b>Colour:</b> Clear, slightly brownish	<b>Odour:</b> None
<b>Temperature:</b> 13.0 °C	<b>Conductivity:</b> 40 µS/cm
<b>pH:</b> 6.76	

Analysis Requested	Container Type/Volume	Preserved	Comments
	1l Plastic	-	
	0.5l Amber Glass	-	
	1 no Vial	-	
	250ml Plastic	H <sub>2</sub> SO <sub>4</sub>	

\*\* Note 5cm ID = 1.962 litres/m

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No. 3 Tara Court  
Naas, Co. Kildare  
tel 045-874411, fax 045-874549

## Environment & Resource Management Ltd

<b>Site Location:</b> _____	Kilmeage	<b>TP No.:</b> _____	1
<b>Project No.:</b> _____	03.082	<b>Company:</b> _____	N&C Enterprises Ltd.
<b>Date:</b> _____	23/05/2003	<b>Stickup:</b> _____	
<b>TOC Elevation (mOD):</b> _____		<b>Well Depth:</b> _____	
<b>Head:</b> _____		<b>Well ID:</b> _____	100mm
<b>Excavation Method:</b> _____	Hymac	<b>Screen:</b> _____	0.3 - 3.8 mBGL

Depth: (m)	Geology:
0 - 0.3	MADEGROUND comprising pale brown soft silty fine sand
0.3 - 0.5	MADEGROUND comprising greyish brown soft silty medium sand
0.5 - 1	MADEGROUND comprising medium brown soft medium sand with rounded cobbles
1 - 2	Dense medium brown SAND with subrounded cobbles and boulders
2 - 3.8	Reddish-brown firm silty GRAVEL with frequent subrounded and subangular cobbles

**Water Entry:** 3.6m

**Sampled:** N/A



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## Environment & Resource Management Ltd

<b>Site Location:</b> _____	Kilmeage	<b>TP No.:</b> _____	2
<b>Project No.:</b> _____	03.082	<b>Company:</b> _____	N&C Enterprises Ltd.
<b>Date:</b> _____	23/05/2003	<b>Stickup:</b> _____	
<b>TOC Elevation (mOD):</b> _____		<b>Well Depth:</b> _____	
<b>Head:</b> _____		<b>Well ID:</b> _____	100mm
<b>Excavation Method:</b> _____	Hymac	<b>Screen:</b> _____	0.5 - 2.5mBGL

Depth: (m)	Geology:
0 - 2	Sandy subrounded COBBLES with boulders
2 - 2.5	Compact orange gravelly Silt

**Water Entry:** 1.5m

**Sampled:** N/A

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## Environment & Resource Management Ltd

### Well Log:

<b>Site Location:</b> _____	Kilmeage	<b>TP No.:</b> _____	3
<b>Project No.:</b> _____	03.082	<b>Company:</b> _____	N&C Enterprises Ltd.
<b>Date:</b> _____	23/05/2003	<b>Stickup:</b> _____	
<b>TOC Elevation (mOD):</b> _____		<b>Well Depth:</b> _____	
<b>Head:</b> _____		<b>Well ID:</b> _____	100mm
<b>Excavation Method:</b> _____	Hymac	<b>Screen:</b> _____	1 - 3m

<b>Depth: (m)</b>	<b>Geology:</b>
0 - 3	Compact gravelly silty subrounded BOULDERS
<b>Water Entry:</b>	0.5m
<b>Sampled:</b>	N/A

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## Environment & Resource Management Ltd

<b>Site Location:</b> _____ Kilmeage	<b>TP No.:</b> _____ 4
<b>Project No.:</b> _____ 03.082	<b>Company:</b> _____ N&C Enterprises Ltd.
<b>Date:</b> _____ 23/05/2003	<b>Stickup:</b> _____
<b>TOC Elevation (mOD):</b> _____	<b>Well Depth:</b> _____
<b>Head:</b> _____	<b>Well ID:</b> _____ 100mm
<b>Excavation Method:</b> _____ Hymac	<b>Screen:</b> _____ 0.5 - 3.5mBGL

<b>Depth: (m)</b> 0 - 3.5	<b>Geology:</b> Dense medium brown sandy gravelly subrounded COBBLES
<b>Water Entry:</b>	1.5m
<b>Sampled:</b>	N/A

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## Environment & Resource Management Ltd

### Trial Pit Log

Site Location: Kilmeage

TP No.: 5

Project No.: 03.082

Company: N&C Enterprises Ltd.

Date: 29/05/2003

Stickup: -

TOC Elevation (mOD):

Well Depth: -

Head:

Well ID: 100mm

Excavation Method: Hymac

Screen: -

**Depth: (m)**

**Geology:**

0 - 0.5

Orangey brown firm gravelly CLAY/SILT with subrounded cobbles and roots with rare bricks

0.5 - 2.5

Greyish brown firm sandy silty/clayey GRAVEL with subrounded cobbles and occasional boulders - cobbles and boulders becoming more frequent with depth

**Water Entry:**

none

**Sampled:**

N/A

Photographs taken

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Diesel Range Organics  
by  
G.C.

Client Name Env. Resource Management Ltd (Kilcullen)  
Client Ref .03.082  
Sample Matrix Water

Job Number B01843  
Date Extracted/Prepared 9/6/2003  
Date Analysed 13/06/03

Separatory Funnel Ext Yes  
Soxtec Extraction No  
Column Extraction Yes

Sample number	Sample Identity	Depth	Diesel Range Hydrocarbons (µg/litre)	Interpretation
005	TP2	-	< 10	No Identification Possible
006	TP3	-	< 10	No Identification Possible
007	TP4	-	< 10	No Identification Possible

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Checked by: David O'Leary  
 Authorised by: David Marley

Mineral Oil

by

G.C.

Client Name Env. Resource Management Ltd (Kilcullen)

Job Number B01843

Separatory Funnel Ext Yes

Client Ref .03.082

Date Extracted/Prepared 9/6/2003

Soxtec Extraction No

Sample Matrix Water

Date Analysed 13/06/03

Column Extraction Yes

Sample number	Sample Identity	Depth	Mineral Oil (µg/litre)	Interpretation
005	TP2	-	< 10	No Identification Possible
006	TP3	-	< 10	No Identification Possible
007	TP4	-	< 10	No Identification Possible

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Checked by David O'Leary

Authorised by David Mackey

# Geochem Analytical Services

Gasoline Range Organics

By

GC

Job No: DUB-03-B01843

Client: Env. & Resources Mang. Ltd.

Client Ref: 03.082

Date Extracted 5/6/3

Date Analysed 5/6/3

Matrix: Water

Units: µg/l

Sample No	Sample Ref	Depth m/ft	Total C5-C9	Total C10+
S0004	TP1	-	<10	<10
S0005	TP2	-	<10	<10
S0006	TP3	-	<10	<10
S0007	TP4	-	<10	<10

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Checked by.....*S. Bawed*.....

Authorised by:-.....*f. mcLanahan*.....

# Geochem Analytical Services

## BTEX (MTBE) Analysis

By  
G.C.

Job No: DUB-03-B01843

Client: Env. & Resources Mang. Ltd.

Client Ref: 03.082

Date Extracted 5/6/3

Date Analysed 5/6/3

Matrix: Water

Units: µg/l

Smpl No	Sample Ref	Depth m/ft	MTBE	Benzene	Toluene	Ethyl Benzene	Total Xylene
S0004	TP1	-	<10	<10	<10	<10	<10
S0005	TP2	-	<10	<10	<10	<10	<10
S0006	TP3	-	<10	<10	<10	<10	<10
S0007	TP4	-	<10	<10	<10	<10	<10

Checked by..... S. Bared.....

Authorised by:- L. M. W. D. ...