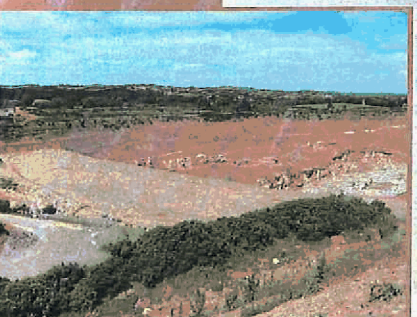


Irish Gypsum Ltd.

Environmental Impact Statement



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**In support of an application to
extend the existing opencast mine
within the company's
landholding at Knocknacran East,
Knocknacran West, Drummond,
Derrynaglah, Derrynascobe and Enagh
Co. Monaghan**

Prepared by:



BRADY SHIPMAN MARTIN

TABLE OF CONTENTS

LIST OF FIGURES, PLATES & TABLES	III - IV
APPENDICES	V
GLOSSARY OF TERMS	VI - VII
EPA GLOSSARY OF TERMS	VIII -IX
1. INTRODUCTION.....	1.1- 1.8
Introduction	
Need for Environmental Impact Assessment	
Gypsum	
The Applicant – Irish Gypsum Ltd.	
Mining	
Need for Proposal	
Alternatives	
Scoping & Consultations	
Acknowledgements	
Contributors	
Study Team	
2. NON-TECHNICAL SUMMARY.....	2.1 - 2.8
Introduction	
The Uses of Gypsum	
Irish Gypsum Ltd	
Need for the Proposal	
The Proposal	
Environmental Topics	
3. DESCRIPTION OF SCHEME	3.1 - 3.8
Introduction	
The Proposal	
Gypsum at Knocknacran	
Current Practices	
Project Development	
Environmental Control	
Planning context	
4. HUMAN BEINGS.....	4.1 - 4.4
Introduction	
Receiving Environment	
Socio Economic Profile	
Impact of the Development	
Mitigation Measures	
5. FLORA & FAUNA.....	5.1 - 5.5
Introduction	
Habitats and Vegetation	
Fauna	
Evaluation	
Impact of the Development	
Mitigation Measures	
6. GEOLOGY & SOILS.....	6.1 - 6.5
Introduction	
Receiving Environment	
Potential Impact	
Design, Operation and Mitigation Measures	
References	
7. WATER.....	7.1 - 7.12
Introduction	
Existing Environment	
Potential Impacts	
Predicted Impacts	
Design, Operation and Mitigation Measures	
References	

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8. AIR QUALITY.....	8.1 - 8.13
Introduction	
Description of the Receiving Environment	
Methodology	
Characteristics of the Proposed Development	
Predicted Impact of the Proposal	
Mitigation Measures	
Forecasting Methods	
9. TRAFFIC.....	9.1 - 9.4
Introduction	
Receiving Environment	
Proposed Development	
Traffic Generation and Highway Impact	
Mitigation Measures	
10. NOISE & VIBRATION	10.1 - 10.4
Introduction	
Receiving Environment	
Characteristics of the proposal	
Potential Impact	
Predicted Impact	
Remedial or Reductive Measures	
Mitigation Measures	
Monitoring	
11. CULTURAL HERITAGE.....	11.1 - 11.5
Introduction	
Recorded Monuments within the study area	
Historical, Archaeological and Folklore Background	
Site Investigation	
Potential Impact of the Development	
Mitigation Measures	
12. LANDSCAPE.....	12.1 - 12.5
Receiving Environment	
Site Context	
Characteristics of the Proposal	
Potential Impact	
Remedial or Reductive Measures	
Predicted Impact	
Monitoring	
Summary	
13. CLOSURE.....	13.1 - 13.10
Introduction	
Closure Aim & Objectives	
The Existing Environment	
The Proposed Closure Plan	
Potential Impacts	
Predicted Impacts	
Mitigation	
Costs	
14. INTERACTION OF THE FOREGOING.....	14.1 - 14.1
15. CONCLUSION.....	15.1 - 15.2

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List of Figures

General Site location	Figure 1.1a
Site Location and Extent.	Figure 1.1b
Application Areas	Figure 1.2a
Application Areas	Figure 1.2b
Principal Destinations for Gypsum	Figure 1.3
Existing and proposed opencast mine extraction areas	Figure 3.1
Other gypsum mines.	Figure 3.2
Project phasing	Figure 3.3
Location of neighbouring Proposerties	Figure 4.1
Location of nearest designated sites	Figure 5.1
Soil map	Figure 6.1
Subsoil map	Figure 6.2
Bedrock geology map	Figure 6.3
Geological positions of groundwater monitoring points	Figure 6.4
Faults, mine extents and gypsum sub crops	Figure 6.5
Irish Gypsum Ltd. facilities at Knocknacran	Figure 7.1
Areas within Knocknacran facility	Figure 7.2
Current and proposed boundary	Figure 7.3
Rivers, streams and catchments	Figure 7.4
River flow measurements at CP1	Figure 7.5
Water management system	Figure 7.6
Site drainage patterns and zones	Figure 7.7
Mine effluent measurements at MSE-1	Figure 7.8
Sulphate concentrations at upstream monitoring point on River Burske, at MSE1, at CP1 and at MSW1	Figure 7.9
Conductivity values at upstream monitoring point on River Burske, at MSE1, at CP1 and at MSW1	Figure 7.10
Sampling locations for biological surveying & EPA water quality mapping	Figure 7.11
Aquifer classifications	Figure 7.12
Location of trial wells	Figure 7.13
Ground water monitoring points	Figure 7.14
Cross section through quarry and piezometry	Figure 7.15
Results of ground water sampling - conductivity	Figure 7.16
Results of ground water sampling - sulphate	Figure 7.17
Conceptual model of hydrogeological inputs and outputs	Figure 7.18
Extent of gypsum beds and dolerite sill	Figure 7.19
Zone of contribution to Irish Gypsum facilities at Knocknacran	Figure 7.20
Groundwater flow directions	Figure 7.21
Reduced water levels in overburden	Figure 7.22
Reduced water levels in upper gypsum	Figure 7.23
Reduced water levels in Namurian	Figure 7.24
Reduced water levels in middle mudstones	Figure 7.25
Reduced water levels in upper mudstones	Figure 7.26
Reduced water levels in lower mudstones	Figure 7.27
Reduced water levels in dolerite of middle mudstone	Figure 7.28
Reduced water levels in dolerite of lower mudstone	Figure 7.29
Reduced water levels in Westphalian shales	Figure 7.30
Predicted phase 1 annual average dust deposition ($\text{mg}/\text{m}^2/\text{day}$)	Figure 8.1
Predicted phase 1 annual average PM_{10} concentration ($\mu\text{g}/\text{m}^3$)	Figure 8.2
Predicted phase 1 annual average $\text{PM}_{2.5}$ concentration ($\mu\text{g}/\text{m}^3$)	Figure 8.3
Predicted phase 6 annual average dust deposition ($\text{mg}/\text{m}^2/\text{day}$)	Figure 8.4
Predicted phase 6 annual average PM_{10} concentration ($\mu\text{g}/\text{m}^3$)	Figure 8.5
Predicted phase 6 annual average $\text{PM}_{2.5}$ concentration ($\mu\text{g}/\text{m}^3$)	Figure 8.6
Predicted phase 14 annual average dust deposition ($\text{mg}/\text{m}^2/\text{day}$)	Figure 8.7
Predicted phase 14 annual average PM_{10} concentration ($\mu\text{g}/\text{m}^3$)	Figure 8.8
Predicted phase 14 annual average $\text{PM}_{2.5}$ concentration ($\mu\text{g}/\text{m}^3$)	Figure 8.9
Location of existing dust monitoring locations	Figure 8.10
Historical context	Figure 11.1

Photoview locations	Figure 12.1
Landscape plan for the opencast mine.	Figure 12.2
Properties in proximity to Drumgoosat Mine	Figure 13.1

List of Plates

Current Opencast Pit Area Clearly showing the 2 seams of gypsum present at Knocknacran	Plate 3.1
Existing facilities at the mine site used for processing gypsum prior to its transportation off site	Plate 3.2
Inside the homogeniser: Material enters from the secondary crusher and is blended before conveying to the loading area.	Plate 3.3
Photographs 12.1-12.5	
Photograph of lands above Drumgoosat Mine showing no signs of surface disturbance.	Plate 13.1

List of Tables

List of consultees.	Table 1.1
Gypsum extraction rates and overburden relocation.	Table 3.1
Summary of environmental monitoring.	Table 3.2
Population change at local, regional and national level between 1996, 2002 and 2006.	Table 4.1
Employment analysis for Enagh ED.	Table 4.2
Employment by profession for Enagh DED, County Monaghan and the State, 2002.	Table 4.3
Socio-economic profile for Enagh ED, County Monaghan and the State, 2002.	Table 4.4
Strength parameters of overburden and interburden at Knocknacran	Table 6.1
Depths of mining	Table 7.1
Catchment areas & annual flows	Table 7.2
Annual volumes of mine effluent discharged into River Burske	Table 7.3
Partitioning of annual volume of mine effluent	Table 7.4
Average winter & summer sulphate and conductivity values	Table 7.5
Increased abstractions as result of proposed development	Table 7.8
Air Quality Standards for Dust Deposition, PM ₁₀ & PM _{2.5}	Table 8.1
Rainfall and Wind Speed Seasonal Averages at Clones (1961 –1990)	Table 8.2
Dust Deposition Monitoring Results for Knocknacran Quarry in 2005 (mg/m ² /day).	Table 8.3
Volumes and tonnage of gypsum and overburden	Table 8.4
Category 3 Mechanically Generated Aggregate Taken From AP-42 ⁽⁶⁾	Table 8.5
Modelled Dust Deposition Level And PM ₁₀ / PM _{2.5} Concentration Resulting From The Proposed Gypsum Quarry.	Table 8.6
Traffic Growth Rates	Table 9.1
Summary of PICADY Modelling – Site Access Junction	Table 9.2
Summary of PICADY Modelling for R179 Junction	Table 9.3
Summary of environmental noise monitoring, May 2006, mean values and standard deviations.	Table 10.1
Costs associated with the implementation of the closure plan	Table 13.1

List of Appendices

NB: For ease of reference the Appendix numbers correspond to the referring Chapter numbers.

- Appendix 1
 - Chapter 1
 - Appendix 1a – Knocknacran Potential Quarry Extension
 - Appendix 1b – Consultation letters.
- Appendix 2
 - Chapter 2
 - Not Required
- Appendix 3
 - Chapter 3
 - Appendix 3a Existing ground contours
 - Appendix 3b Proposed final contours
 - Appendix 3c Sections
 - Appendix 3d Project phasing
- Appendix 4
 - Chapter 4
 - Not Required
- Appendix 5
 - Chapter 5
 - Not Required
- Appendix 6
 - Chapter 6
 - Proposed Quarry Extension Slope Stability Assessment
- Appendix 7
 - Chapter 7
 - Water Section – Supporting Tables
- Appendix 8
 - Chapter 8
 - Air Modelling
- Appendix 9
 - Chapter 9
 - Traffic Data
- Appendix 10
 - Chapters 10
 - Not Required
- Appendix 11
 - Chapter 11
 - Not Required
- Appendix 12
 - Chapters 12
 - Landscape Drawings – see also planning application drawings
- Appendix 13
 - Chapter 13
 - Appendix 13a – An assessment of the impact of mine flooding on the long term stability of Drummond mine.
 - Appendix 13b - Closure drawing
- Appendix 14
 - Chapter 14
 - Not Required
- Appendix 15
 - Chapters 15
 - Not Required

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Glossary of Terms

BH	Boreholes
BOD	Biological Oxygen Demand
BS	British Standard
CO	Carbon monoxide
COD	Chemical Oxygen Demand
CSO	Central Statistics Office
dBA	decibels
EC	European Community
ED	Electoral Division
EEC	European Economic Community
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
GSI	Geological Survey of Ireland
ha	hectares
HGV	Heavy Goods Vehicle
hrs	hours
JNCC	Joint Nature Conservancy Council
kg	kilograms
km	kilometres
km/hr	kilometres per hour
km ²	square kilometers
L _(Aeq, 15 min)	The equivalent continuous noise level in dBA over the 15 minute measuring interval
L _(A90, 15 min)	The noise level in dBA equalled or exceeded for 90% of the 15 minute measuring interval
ltd	Limited company
m	metres
m ²	square metres
m ³	cubic metres
m ³ /day	cubic metres per day
m ³ /yr	cubic metres per year
m/yr	metres per year
min	minutes
MIC	Maximum Instantaneous Charge
mg/l	milligrams per litre
mg/m ² /day	milligrams per square metre per day
mm	millimetres
mm/yr	millimetres per year
m/s	metres per second
NMI	National Monuments of Ireland
No.	Number
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NRA	National Roads Authority
OD	Ordnance Datum
PE	Potential Evapotranspiration
pH	-log ₁₀ hydrogen ion concentration
PI	Poor Aquifer (Generally Unproductive)
PM	Particulate Matter
pNHA	proposed Natural Heritage Area
Q rating	Irish Water Quality Rating
R	design rainfall
r	Rainfall ratio
s.d.	Standard Deviation
SI	Statutory Instrument

SO₂
UK
°
@
µg/m³

Sulphur dioxide
United Kingdom
degrees
at
micrograms per cubic metre

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EPA - Glossary of Terms

Quality of impacts	Positive Impact	A change which improves the quality of the environment.
	Neutral Impact	A change which does not affect the quality of the environment.
	Negative Impact	A change which reduces the quality of the environment.

Significance of Impacts	Imperceptible Impact	An impact capable of measurement but without noticeable consequences.
	Slight Impact	An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Impact	An impact that alters the character of the environment in a manner that is consistent with existing or emerging trends.
	Significant Impact	An impact which, by its very character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Profound impact	An impact which obliterates sensitive characteristics.

Duration of Impacts	Short-term Impact	Impact lasting one to seven years.
	Medium-term Impact	Impact lasting seven to fifteen years.
	Long-term Impact	Impact lasting fifteen to sixty years.
	Permanent Impact	Impact lasting over sixty years.
	Temporary Impact	Impact lasting for one year or less.

Types of Impact	Cumulative Impact	The addition of many small impacts to create one larger, more significant, impact.
	Do Nothing Impact	The environment as it would be in the future should no development of any kind be carried out.
	Indeterminable Impact	When the full consequences of a change in the environment cannot be described.
	Irreversible Impact	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Impact	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Impact	Where the resultant impact is of greater significance than the sum of its constituents.
	Worst case' Impact	The impacts arising from a development in the case where mitigation measures substantially fail.

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1 INTRODUCTION

Introduction

- 1.1 This Environmental Impact Statement has been prepared to accompany a planning application to Monaghan County Council by Irish Gypsum Ltd., Unit 14, Park West Industrial Park, Dublin 12. Planning permission is sought by the Company to increase the extraction area of the opencast gypsum mine at Knocknacran, near Carrickmacross, Co. Monaghan.
- 1.2 The site is located approximately 4.5 km south west of Carrickmacross and a similar distance from Kingscourt, Co. Cavan. The site is close to the Cavan/Monaghan border and falls within the jurisdiction of Monaghan County Council. The location of Knocknacran opencast mine is shown in Figure 1.1a, its extent is shown on Figures 1.1b to 1.2b. The proposed development area extends to 54.86 ha (135.56 acres). This area includes the permitted extraction area, the proposed extraction area and earthworks associated with this application. The area of extraction of gypsum will increase from 19.174 ha (47.38 acres) to 30.694 ha (75.86 acres), representing an increase of 11.5 ha (28.47 acres) or 60%. The extent of the proposal is shown in Figure 1.2a and 1.2b. Full details on the proposed development are provided in Chapter 3.

Need for Environmental Impact Assessment

- 1.3 Environmental Impact Assessment (EIA) procedures are required for certain types and scales of development, set out in the European Directive (85/337/EEC) amended by the Council Directive 97/11/EC and effected by Statutory Regulations in Ireland (S.I. No. 600 of 2001, S.I. Nos. 92 and 93 of 1999 and S.I. No. 349 of 1989). The fifth Schedule of the Planning and Development Regulations 2001 (S.I. No. 600 of 2001) specifies development to which EIA applies and for which an EIS is required. The proposed development at Knocknacran falls into the category of 'mineral extraction, by surface or underground methods, of materials other than sand, gravel stone or clay, i.e., minerals as defined by the Minerals Development Acts 1940 to 1979'. Under this Act gypsum is defined as a mineral.
- 1.4 The content and structure of this Environmental Impact Statement are in accordance with the EPA Guidelines for the preparation of EIS.¹

Gypsum

- 1.5 Gypsum is a non-metallic mineral, which is found in rock form. It is composed of calcium sulphate and water and has the chemical composition of $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. The water contained in gypsum is known as "water of crystallisation". The water contained in gypsum will not be released until temperatures in excess of 100°C are reached. It then forms water vapour. This means that gypsum offers considerable fire protection and is why gypsum-based products are used extensively in the construction industry to line the walls of houses, offices and commercial outlets.
- 1.6 Gypsum has a number of important uses such as;
- **Plaster and plasterboard** - When gypsum is ground up and calcined (heated to high temperatures) until 75% of the combined water is removed, it forms a powder known as stucco or plaster of paris. By adding water one can make a mix which can be formed into any shape

- and then allowed to harden. Other additives can be mixed with the stucco to produce a wide range of plasterboards and building plasters.
- **Cement manufacture** - Gypsum is used as an additive in cement, its purpose is to regulate setting times.
 - **Soil conditioner** - Gypsum is used as a soil conditioner to help loosen and aerate hard packed soils or heavy clays.
- 1.7 Other uses for gypsum include pottery, glass and metal moulds, medical casts and dental plaster moulds, and as an additive in the food and drink industry.
- 1.8 The uses and benefits of gypsum are wide ranging. The sourcing, extraction and manufacturing of gypsum based products is crucial to numerous industries throughout the world. It is an essential component of modern day life, providing safer working and living environments, aiding the recovery of damaged limbs and enabling food production in areas previously infertile.

The Applicant – Irish Gypsum Ltd.

- 1.9 The Company has been established in the Kingscourt area for over 60 years. During this time the company has contributed significantly to the economy of the area. The Company currently operates an opencast mine at Knocknacran and an underground mine adjacent to the opencast facility as well as a manufacturing facility near Kingscourt. The company is a significant employer in the region, employing up to 300 people at its existing extraction, processing and manufacturing facilities.
- 1.10 The gypsum supplied to the manufacturing facility near Kingscourt is sourced entirely from the opencast and underground mines at Knocknacran and Drummond located approximately 10 km away by road (R179). The Knocknacran facility, which opened in 1989, replaced underground mines at Drumgill and Drumgoosat as a local source of gypsum. The underground mine at Drummond commenced extraction in 2006. The gypsum extracted is also supplied to the Irish cement industry for use as an additive and to the Irish agricultural industry.
- 1.11 The manufacturing facility near Kingscourt creates products which are specifically designed for the Irish construction industry. The Company is the market leader in Ireland. Some of the brand names used by the Company include Gyproc, Pinnacle, Skimcoat, Gyplite, Artex, Gyptone, Casoprano and Blue Hawk. The products are finished to high standards and comply fully with the specifications and requirements of the Irish, British and International Standards. The company supplies both the Irish and international marketplace.
- State Mining Lease**
- 1.12 Irish Gypsum Ltd. hold a state mining lease (No. 139), granted by the Minister for Communications, Marine and Natural Resources in November 2002. This lease covers all of the lands proposed for gypsum extraction in this planning application.

Mining

- 1.13 Minerals, such as gypsum, must be extracted where they occur. The process of extraction of natural gypsum can only be undertaken by mining. Mining is loosely defined as the removal of minerals from the earth and is one of man's oldest activities and an important aspect of modern life. The main objective of any type of mining is to remove the material economically and safely with minimal damage to the surrounding environment.
- 1.14 The method used to mine a specific commodity depends chiefly on the geology and location of the deposit or resource. It also depends on the type of material, the seam attributes and the depth of the deposit. In some instances, the deposit is relatively flat

and continuous over a large area. These deposits are found in beds, or seams, between layers of rock. However, in many instances deposits are disjointed and non-homogenous.

- 1.15 There are two basic methods of mining, namely opencast mining and underground mining. Opencast mining usually requires the removal of soil and/or rock before removal of the deposit can commence. The deposit is removed in benches or stair steps. The process is similar to quarrying. Underground mining involves the extraction of the required material with minimal impact on the surface. The deposit is worked underground and the mined material is brought to the surface where it is normally processed in some form to produce a usable product.
- 1.16 The Company currently employ both methods of mining to extract gypsum. The Knocknacran opencast mine has, as stated, been in operation since 1989 and extraction in the underground mine at Drummond commenced in 2006. The underground mine operated by the Company employs a method known as 'Room and pillar' mining. The 'Rooms' are cut into the deposit leaving a series of 'Pillars', roof beams and floor beams to support the mine roof. The location of both mines is shown in Figure 1.2a and 1.2b. Both mines share processing facilities at Knocknacran. This proposal is for an extension to the opencast mine using opencast mine techniques. This is discussed further in Chapter 3.

Need for Proposal

- 1.17 Gypsum is a commodity which is in use in a number of industries in one form or another. It is in high demand for use in products such as building plaster (plaster of paris, orthopaedic plaster, dental plaster), plasterboard, as an essential additive for the production of cement and as a soil conditioner. The majority of the gypsum sourced at Knocknacran and Drummond is used in the construction industry, either at the Company's processing facility at Kingscourt or by cement producers as an additive (see Figure 1.3).
- 1.18 The construction industry has grown considerably over the past number of years and so too has the demand for essential raw materials which includes gypsum. Realising the demand for gypsum and gypsum based products was growing and reserves in the existing permitted opencast mine were diminishing, Irish Gypsum Ltd applied to Monaghan County Council for full planning permission to develop an underground mine. The underground mine was granted full planning permission in 2004.
- 1.19 More recently the Company has carried out a review of the reserves within its land holding. The assessment found that the gypsum outside the permitted extraction area (MCC Pl. Ref. No: 83/461) but within the Company's land holding is of a useable grade and in sufficient volumes to make a proposal to extend the opencast mine viable. The gypsum sourced from an extended extraction area will serve to augment supplies from the permitted underground mine and would make best use of the reserves at Knocknacran. The proposal is therefore in the interests of sustainable resource extraction, working an extended extraction area to augment secured and permitted reserves.
- 1.20 The Company's review (see Appendix 1a) of the potential for extending the reserves around the edges of the existing Knocknacran opencast mine deemed it to be a justifiable venture based on the following;
- The current pit limit in the north was based on the old route of the R179. The new route alignment is further to the north and therefore allows for expansion.
 - The advances in earth moving machinery capabilities and therefore the reduction in stripping costs allows for the economic extraction of greater overburden thicknesses.

- Recent experience of extracting and blending away low grade gypsum (anhydrite) has made some areas viable which had previously been rejected.
- The realisation (based on experience from Drumgoosat Mine), that production from Drummond mine will probably include significant quantities of low grade gypsum (anhydrite) rock as well as higher quality minerals.

Alternatives

- 1.21 As part of the Environmental Impact Assessment (EIS) process it is necessary to consider alternatives. 'Alternatives' have been divided in 4 key areas;
- (1) Alternatives to gypsum;
 - (2) Alternative locations;
 - (3) Alternative methods; and
 - (4) Alternative extraction area.

Gypsum Alternatives - Synthetic (F.G.D.) Gypsum & Imports

- 1.22 Gypsum and gypsum derived products are in demand throughout a number of significant industries. There are no alternative forms of gypsum available in Ireland at this time such as Synthetic Gypsum derived from the Flue Gas Desulphurisation (FGD) process.

- 1.23 If gypsum supplies cannot be sourced locally, then rock must be imported. The importation of rock would result in increased transport from the coast, job losses locally, and ultimately to significantly increased costs to the consumer.

Alternative Mining Locations

- 1.24 The only other known gypsum deposit of potential interest in Ireland occurs in Glangevlin, County Cavan. This deposit was rejected as a source of gypsum by the Company for both safety and technical reasons. Other considerations such as set-up costs, transportation costs, etc. render the exploitation of the Glangevlin reserves by the Company unfeasible at this time.

Alternative Mining Methods

- 1.25 The proposal is for a natural extension to the existing opencast mining area which will serve to augment production from the existing underground mine.

Alternative Extraction Area

- 1.26 The area proposed for extraction is based on the location of reserves within Irish Gypsum Ltd's current land holding at Knocknacran. The area is the maximum available based on the criteria above as well as safety issues and workability. There is therefore no viable alternative to the proposed extraction area.

Conclusions

- 1.27 The proposed extension to the Knocknacran opencast mine as described in this document is desirable because;
- (I). The Kingscourt Gypsum deposit is the only known viable source of gypsum in Ireland.
 - (II). The proposed extension is located in an area with an established history of gypsum mining and processing.
 - (III). The proposed extension will utilise the reserves present at Knocknacran within the applicants landholding. It is therefore making best use of the location, the facilities and the expertise of the Company.
 - (IV). The proposed mining method will allow gypsum to be extracted in a safe manner with the least possible impact on the environment and the least possible disruption to the local community.

Scoping & Consultations

- 1.28 As part of the Environmental Impact Assessment procedure, a number of consultations were held with interested parties.
- 1.29 The list of consultations held is provided in Table 1.1. As well as the statutory consultees the Company has informed the local community of its plans. A letter was sent to locals in the vicinity of the mine to inform them of the Company's intention to extend the extraction area of the opencast mine. A copy of the letter is provided in Appendix 1b, all responses are provided in Appendix 1c.

Table 1.1: List of consultees.

Organisation	Location	Date
Local Residents	Through letter – See Appendix 1b and 1c.	From 12/12/06 onwards
Environmental Protection Agency	Through letter – See Appendix 1b.	13/12/06
Department of Communications, Marine and Natural Resources	Beggars Bush, Dublin	29/9/06
Monaghan County Council	Monaghan County Council, Civic Offices, The Glen, Monaghan	29/11/06

- 1.30 The scoping procedure for the Environmental Impact Statement identified that the principal elements of the proposed development which would potentially be of environmental concern are:
- Environmental Noise and Vibration;
 - Traffic; and
 - Water Quality.
- 1.31 The concerns of those consulted have been addressed in detail throughout this EIS. In addition to the consultations listed above continuous dialogue was maintained between the developer, planning consultants, specialist consultants and engineers throughout the development of the EIS. This allowed for the incorporation of feedback arising from consultations into the final design of this proposal.

Acknowledgements

- 1.32 The consultants wish to thank all those who assisted in the preparation of the Environmental Impact Statement.
- 1.33 Some of the figures and maps accompanying this Environmental Impact Statement are reproduced from and based on the Ordnance Survey by permission of the Government Licence No. AR 0001307. The Ordnance Survey Sheets used throughout the EIS are Co. Monaghan Sheet Nos. 31 & 32, Co. Cavan Sheet Nos. 29 & 35 and OS sheets 1825 and 1826. An Ordnance Survey Discovery Series Map No. 35 is also used as is an aerial photograph, which was supplied by Aero Maps Ireland.

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¹ Guidelines on the Information to be contained in Environmental Impact Statements, Environmental Protection Agency, 2002.

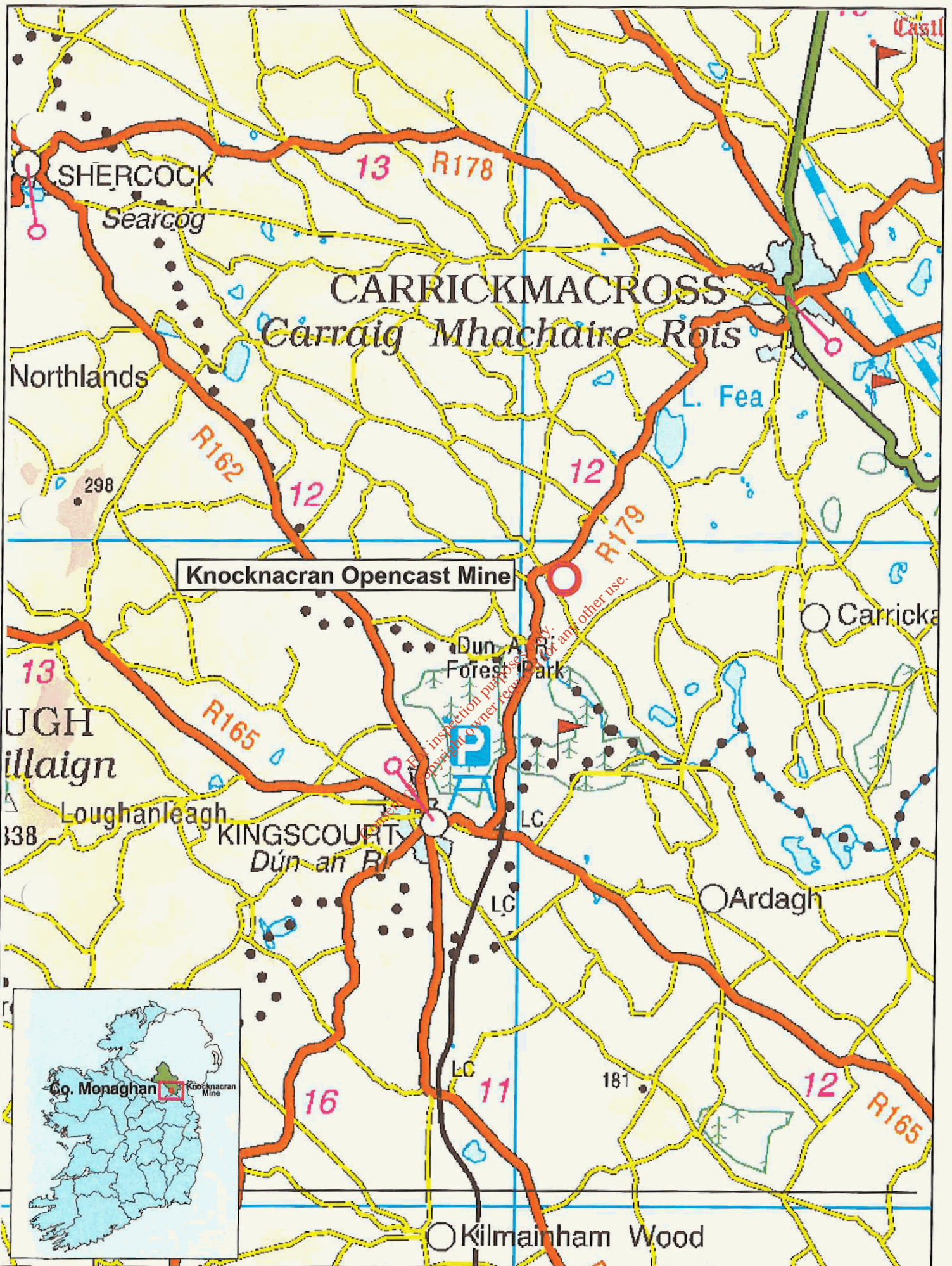


Fig 1.1a: General Site Location

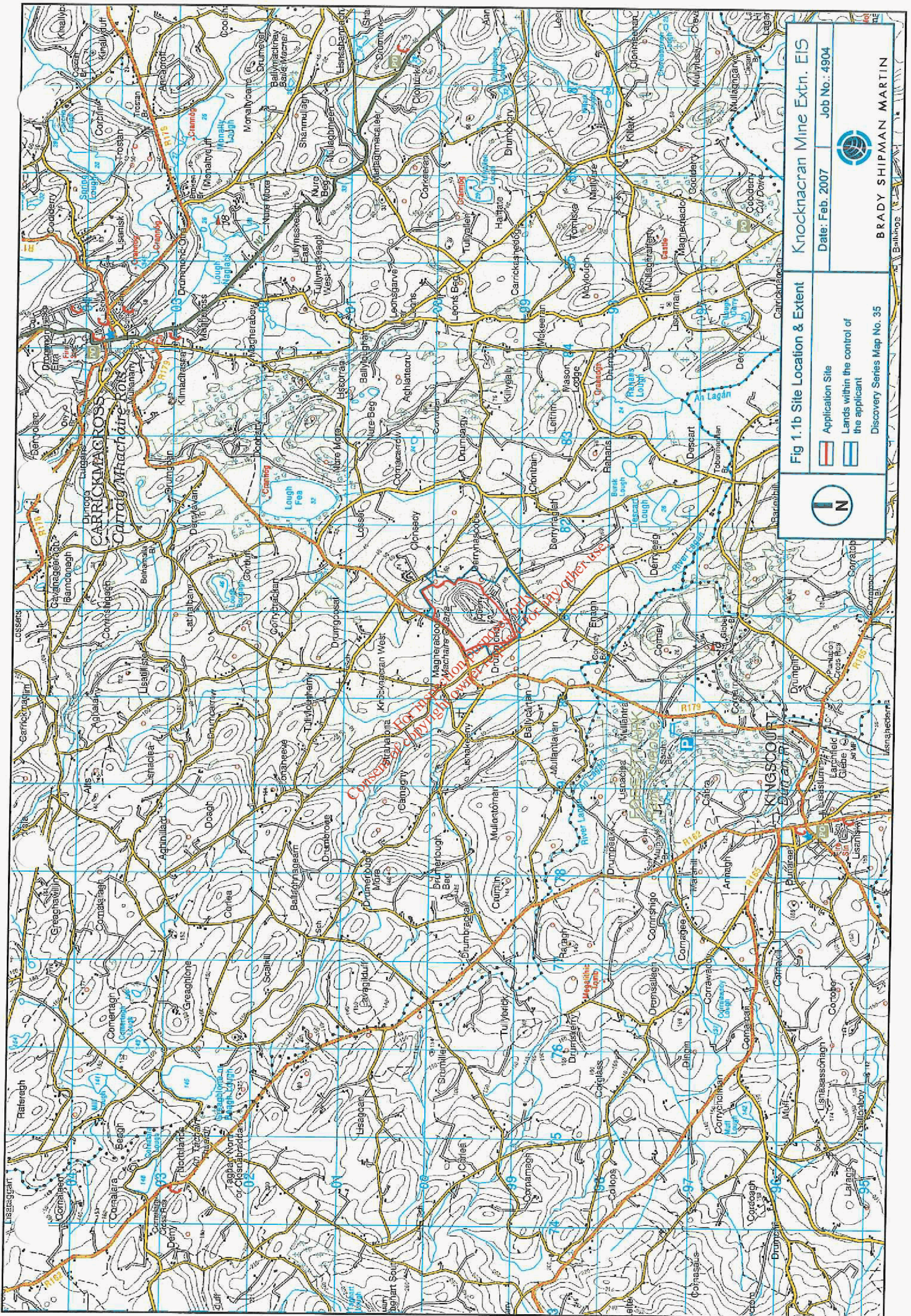
Knocknacran Mine Extn. EIS

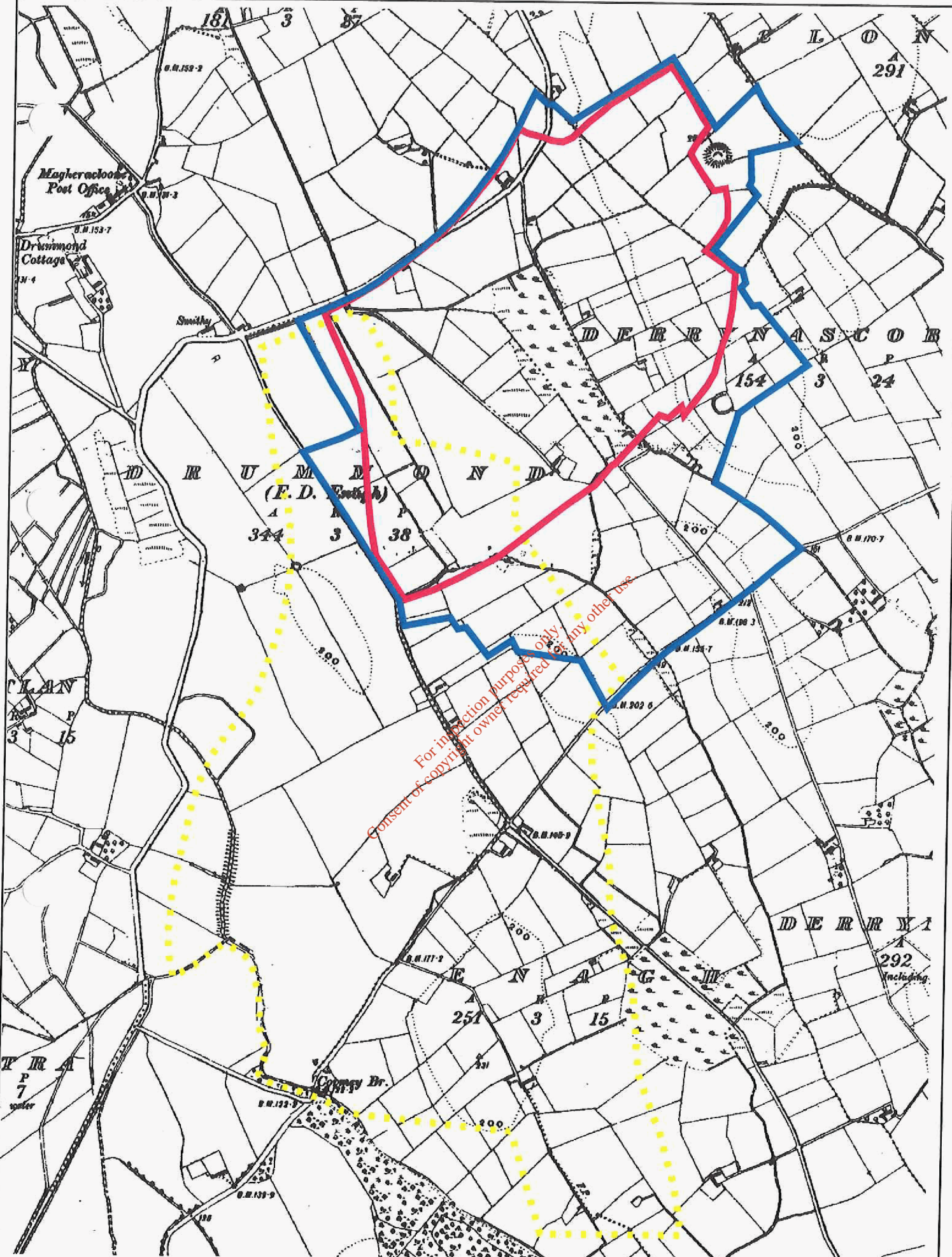
Date: Feb. 2007

Job No.: 4904



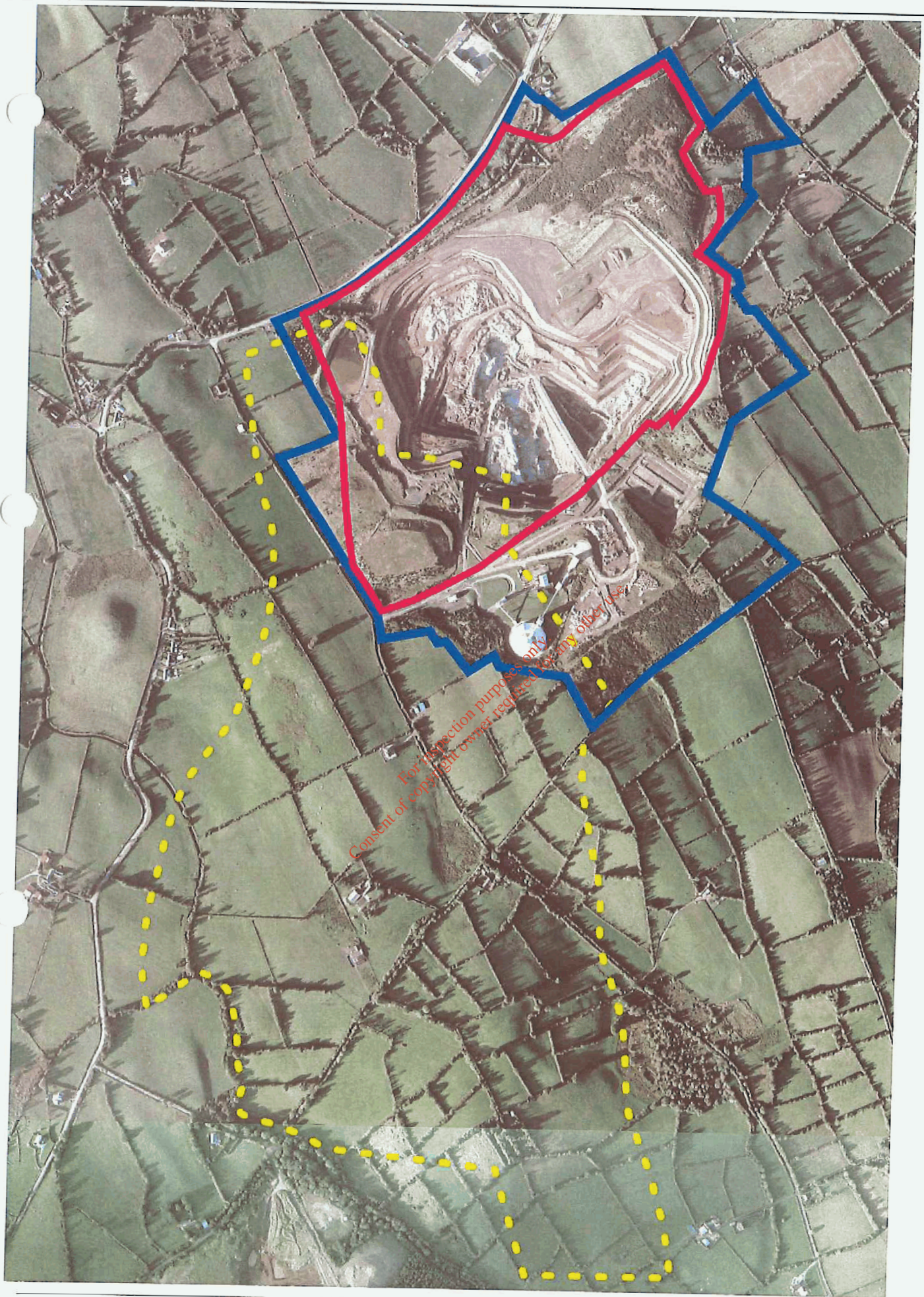
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- Proposed Application Area
- Lands under the control of the applicant
- Drummond Mine (Pl. Ref. No: 578/03)

	Fig 1.2a: Application Areas		Knocknacran Mine Extn. EIS	
			Date: Feb. 2007	Job No.: 4904
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-  Application Area
-  Property Boundary
-  Extent of underground mine (Pl. Ref. No: 578/03)

	Fig 1.2b: Application Area		Knocknacran Mine Extn. EIS	
			Date: Feb. 2007	Job No.: 4904
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2 Non Technical Summary

Introduction

2.1 This chapter is a Non-Technical Summary of the detailed Environmental Impact Statement submitted to Monaghan County Council in support of an application by Irish Gypsum Limited for permission to extend the extraction area of the permitted opencast gypsum mine at Knocknacran, Co. Monaghan.

2.2 The Environmental Impact Statement outlines the project, including the proposed mining method and management, identifies in summary the anticipated positive and negative impacts of the scheme on the environment, including human beings and describes the mitigation measures incorporated into the proposal. As far as possible, the chapter seeks to avoid the use of highly technical language.

Environmental Impact Assessment

2.3 Environmental Impact Assessment (EIA) is a statutory process by which certain designated development proposals are assessed to establish the potential impact on the environment. It comprises two elements. An Environmental Impact Statement (EIS) is prepared to support the planning application. The statement, prepared by or on behalf of the applicant, is then assessed by the competent authorities - in this case Monaghan County Council – and forms an input into the decision making process, together with other considerations, including submissions from the public.

2.4 The full EIS contains detailed information including the results of site investigations and other studies, together with detailed analysis. The preparation of the EIS, by a team of specialists, and the design of the project informed each other, so that appropriate mitigation measures are included as an integral part of the proposal.

The Uses of Gypsum

2.5 Gypsum is a product widely used throughout the world, especially in the construction industry, where its fire retardant properties provide it with an advantage over competing products. Other uses for gypsum include pottery, glass and metal moulds, medical casts and dental plaster moulds, and it is also used as an additive in the food and drink industry.

2.6 The gypsum produced in the proposed mine will be used for the following purposes:

- Plaster and plasterboard manufacture;
- Cement production; and
- Soil conditioner.

2.7 The demand for gypsum has grown in recent years in response to the growth of the Irish economy and the related expansion of the construction industry.

Irish Gypsum Limited

2.8 Irish Gypsum Limited, together with its associated companies, has been established in the Kingscourt area for over 60 years. During this time the company has contributed

significantly to the economy of the area. It is also a major employer, employing up to 300 people at its existing facilities.

- 2.9 The company currently operates an opencast mine at Knocknacran which opened in 1989. The Company received full planning permission for an underground mine in 2004 which began production earlier this year. The underground mine is adjacent to, and in part underneath, the applicants land holding at Knocknacran.
- 2.10 The gypsum supplied to the manufacturing facility near Kingscourt, approximately 10 km away, is sourced entirely from operations at Knocknacran and Drummond. The manufacturing facility produces a range of products specifically designed for the Irish construction industry and also supplies the export market. The products are finished to high standards and comply fully with the specifications and requirements of the Irish, British and International Standards. Gypsum extracted at Knocknacran and Drummond is also supplied to the cement and agricultural industries.

Need for Proposal

- 2.11 The construction industry has grown considerably over the past number of years and so too has the demand for essential raw materials which includes gypsum. Realising the demand for gypsum and gypsum based products was growing and reserves in the existing permitted opencast mine were diminishing, Irish Gypsum Ltd applied to Monaghan County Council for full planning permission to develop an underground mine. The underground mine was granted full planning permission in 2004.
- 2.12 More recently the Company carried out a review of the reserves within its land holding. The assessment found that the gypsum outside the permitted extraction area of the Knocknacran opencast mine and within the Company's property holding is of a useable grade and in sufficient volumes to make a proposal to extend the opencast mine viable. The gypsum sourced from an extended extraction area will serve to augment supplies from the permitted underground mine and would make best use of the reserves at Knocknacran. The proposal is therefore in the interests of sustainable resource extraction, working an extended extraction area to supplement and augment secured and permitted reserves.

The Proposal

- 2.23 The application is for full planning permission to extend the existing opencast gypsum mine at Knocknacran, near Carrickmacross, Co. Monaghan. The proposed development area extends to 54.86 Ha (135.56 acres). This includes the proposed increase in extraction area as well as earthworks allowing for the increased extraction area.
- 2.24 The proposed development will increase the extraction area from 19.2Ha (47.4 acres) to 30.69Ha (75.9 acres) representing an increase of 11.5Ha or 60%. The proposed development site is located in the townlands of Knocknacran East, Knocknacran West, Drummond, Derrynascobe, Eangh and Derrynaglah.
- 2.25 The proposed extension will yield an estimated 5 million tonnes of gypsum. However, in order to achieve this some 11 million m³ of overburden (soil material) material will need to be removed and relocated elsewhere within the application site. Extraction through opencast mining methods will continue to 2018, the extent of the existing planning permission for opencast mining.

Mine Management

- 2.27 The environmental control measures which have been employed to date will be employed to deal with the operation of the proposed extension. The company has

complied fully with the conditions as outlined under planning permission PL 18/5/67892, granted in 1985.

- 2.28 In addition, the company have received an Integrated Pollution Prevention and Control Licence (No. 668) from the Environmental Protection Agency. This licence covers the activities of the existing opencast mine, the underground mine and the operations at the processing plant at Kingscourt.

Environmental Topics

Human Beings

- 2.29 Various aspects of the proposal may affect human beings directly or indirectly, positively or negatively. The potential impact arising from specific environmental issues, such as dust and noise, are discussed in the sections below.
- 2.30 The proposed development site is located within the Electoral Division (ED) of Enagh. Enagh ED has experienced a rise in its population between 1996 and 2002 and again to 2006 of 2.9% and 4.3% respectively. The 2006 population of Enagh ED stands at 704 people.
- 2.31 Only a small percentage of the 704 people live in the direct vicinity of the site. Principally residential developments in the area are 'one-off' rural houses serving local needs, with the exception of the Clonsedy residential estate which is located to the north-east of the opencast mine.
- 2.32 Irish Gypsum Ltd., through its mining and processing works at Knocknacran, contributes significantly to the local, regional and national economies. The Company provides employment for 55 people on a full-time basis and an additional 30 people on a seasonal basis through its mining activities and generates significant additional employment in various service and supply industries.
- 2.33 The proposed development will provide continued employment levels in the opencast mine for the duration of this proposal.

Soil and Geology

- 2.34 The main impact on the geology will be the removal of the gypsum deposits from the subsurface and the exposure of overlying material within the slopes surrounding the development.
- 2.35 The proposed batter (a backward slope in the face of a wall or bank) is designed to ensure that the risk of slope failure is effectively eliminated and includes appropriate mitigation measures based on experience at the current opencast mine.
- 2.36 A slope stability assessment concludes that a revised slope profile with an overall slope angle from the top of the slope to the base of approximately 1V:2.5H will remain stable in the long term. The provision of adequate drainage along the benches for perched water tables in the overburden will continue to be employed as is the current arrangement.

Water

- 2.37 The current water management system will be maintained, with the exception of the settlement lagoon to the west of the opencast mine, and the existing infrastructure will be sufficient for the purposes of the proposed development.
- 2.38 A network of piezometers has been established around the opencast mine, which will be maintained. Water levels will be recorded on a monthly basis and water samples are to be taken annually and analysed for sulphate and conductivity, as is current practice.

2.39 The maximum volume of water to be discharged into the Burske, set by the IPPC Licence, is a cumulative volume, based on emissions from Drumgoosat mine, the opencast mine at Knocknacran and Drummond mine.

2.40 In order to mitigate the impact of releasing high sulphate water into the River Burske during times of low flow and therefore low dilutional capacity, a system, by which water from the settlement lagoons can be pumped into the Drumgoosat workings, was installed in July 2005. The system enables the storage of water saturated in sulphate in the high sulphate environment of the underground workings and the release of stored water once flows increase, therefore mitigating against the impact of releasing high sulphate water into the Burske and actively preventing environmental degradation.

Air Quality and Dust

2.41 The potential for dust to be emitted will depend on the type of activity being carried out in conjunction with environmental factors including levels of rainfall, wind speed and wind direction. Sensitivity to dust depends on the duration of the dust deposition, the dust generating activity, and the nature of the deposit.

2.42 Existing dust deposition measurements are conducted on-site at four locations. At all four locations results are generally below the TA Luft limit value of 350 mg/m²/day although at one location (MS1) the annual average is slightly above this value.

2.43 Dust deposition typically occurs in close proximity to the dust-generating source. Only a small number of sensitive locations are present which can be affected by dust deposition. The proposed location of the facility is in an area with a low population density and the nearest sensitive locations beyond the site boundary are in general greater than 100m from the extraction of material.

2.44 The modelling has found that dust nuisance as a result of the operation of the gypsum quarry facility is unlikely based due to implementation of the following mitigation measures:

- Water tanker will be in use on-site during dry weather
- Speed restriction of 40 km/hr on all unpaved roads will apply
- Drill rig will have a dust collection system.
- Primary and secondary crusher will be enclosed
- Conveyor belt will be enclosed
- A wheel wash is in use at the site exit.

Noise and Vibration

2.45 The emission limits as currently set by the EPA will be applied to this proposal. Full monitoring of noise and vibration emissions will continue and records submitted to the EPA as required by the IPPC Licence.

Ambient Noise

2.46 Ambient noise is defined as the totally encompassing sound in a given situation usually being composed of sound from many sources near and far. The existing ambient noise environment has been monitored once a month at each of three locations in the vicinity of the existing opencast mine since operations commenced.

2.47 The predicted impact of the proposed development will be very similar to the current noise impact, attributable to the existing development. The noise due to the transportation of rock by dump truck from the floor of the existing open cast mine to the primary crushers will be the same.

2.48 The predicted noise level at the nearest house, which is located approximately 450 metres to the south west, is 35dBA. This will be well below the noise limits for both daytime and nighttime set in the current planning permission. The environmental noise

impact will therefore be negligible. Noise will continue to be monitored as per the current monitoring arrangements.

Blast Vibration

2.49 Blasting produces shock waves which are transmitted through the ground. A blast vibration limit of 7.5 mm/sec peak particle velocity was set by Monaghan County Council when Knocknacran Opencast mine was opened in 1989. All overground blasts are monitored at a minimum of three locations. Over 600 production blasts were taken since the opencast mine started. 95% of these blasts were below 3.3 mm/sec peak particle velocity.

2.50 A number of remedial measures will be used to minimise blast vibration. These include:

- (i) No blasting will take place closer than 150 m from any noise sensitive location
- (ii) Each blast will be designed to use the maximum number of multi-second time delays in the sequential detonation of blasts in order to minimise the amount of explosive per time delay
- (iii) If necessary, blast hole diameter will be reduced from 104 mm to 89 mm in order to minimise the amount of explosive per time delay
- (iv) If necessary, bench height may be reduced in order to minimise the amount of explosive per time delay.

Air Overpressure

2.51 Blasting also produces shock waves which are transmitted through the air as noise. Blast noise is characterised by containing a large proportion of its energy with a frequency of less than 20Hz. This is below the normal hearing range of the human ear and is called air overpressure rather than noise. Air overpressure may cause a slight rattling of windows or doors, similar to a gust of wind. Consequently, it is often mistaken for ground vibration.

2.52 An air overpressure limit of 125dB was set by Monaghan County Council in 1989. 95% of all blasts resulted in air overpressure readings of less than 116 dB.

2.53 It is proposed to retain the existing vibration limits, as set by the Environmental Protection Agency, of 7.5 mm/sec peak particle velocity and 125dB air overpressure as measured at the nearest noise sensitive location.

2.54 The vibration due to all blasts will be monitored, however the location of these monitoring sites may differ from the existing monitoring locations.

Flora and Fauna

2.55 The site is located in an undulating area of low ridges and hills where cattle and sheep grazing is the predominant type of farming. Amongst the wildlife expected to be found are hare, fox, pygmy shrew, rabbit, linnet, meadow pipit, reed bunting, sedge warbler and grasshopper warbler.

2.56 The habitats and species found within the site are typical of a mine or gravel quarry and contain no species of special interest as far as is known. The area of gorse scrub is notable but again is not rare. Good habitats occur in the surrounding area at the Lagan River and the south-eastern wetland.

2.57 There is no ecological designation (cSAC, SPA or pNHA) on any of the area and little likelihood of one being applied. The Lagan River, though not designated a salmonid water, does contain salmon (which are listed in Annex II of the Habitats Directive, 92/43/EEC).

2.58 The development will result in the loss of a considerable area of gorse scrub and grassed areas and also the north/western settlement lagoon. These changes will have a direct effect on dependent organisms, and in particular, on invertebrates.

Overall these impacts are significant only on a local scale and will have no real influence on heritage values in the county.

- 2.59 On cessation of mining and implementation of the closure plan areas of calcareous subsoil or rock will remain exposed which will become colonised with species-rich vegetation similar to that around other abandoned gypsum mines. This would produce a centre of biodiversity, at least for flowering plants and insects.
- 2.60 The larger void of the opencast mine will have no significant effect on the wetland to the southeast as the heavy soils will support the present water table close to or at the surface.
- 2.61 Given the nature of the site, the history of mining and industrial activities, the proposed extension to the mine as detailed in this EIS will not have an adverse impact on Flora and Fauna.

Landscape and Visual Amenity

- 2.62 The existing opencast mine at Knocknacran is a significant feature in the landscape of the area. The planning permission for the opencast mine requires that the land be reinstated to amenity use when extraction ceases and the development of the underground mine will facilitate this objective, whilst maintaining supplies of gypsum.
- 2.63 The proposed extension will give rise to no additional visual impact to the landscape character of the area. Given the adjoining topography and the form of the opencast mine as it drops below the general ground level of the area, only views from west boundary road shall be altered by the mine extension. The manner to which these views will be altered will be a positive one as the ridge levels are lowered by the extension works. To the North, East and South there will be no visual impacts to the surrounding landscape and residential dwellings.

Traffic

- 2.64 Traffic levels on the road network of the area are generally low but have a relatively high proportion of Heavy Goods Vehicles (HGVs). This is due in part to the existing opencast mining operation but also due to traffic generated by commercial and industrial activity in Kingscourt and Carrickmacross. Analysis shows that the capacity of the junction of the R179 (Kingscourt to Carrickmacross Road) and the county road providing access to the mine is significantly higher than current volumes of traffic.
- 2.65 Output at the site will not increase due to the proposed development, but may incur minor fluctuations responding to changes in market demand. The development will not lead to significant increases in traffic volumes such as HGVs, LGVs or private cars, entering or leaving the site. The output of the proposed mine will be dictated by market demand but will be similar to the output of the existing Knocknacran Mine.
- 2.66 Consequently, traffic movements to and from the site are not anticipated to vary significantly from the current pattern and the additional impact of the proposal on traffic is therefore insignificant. The proposed development will not therefore have an adverse impact on the existing traffic environment within the locality.

Cultural Heritage

- 2.67 Two recorded monuments lie within the study area. Both of these monuments are ringforts and consist of stone and earthen banks and external ditches which enclose sub-circular areas measuring approximately 30m across. One of the ringforts lies within the applicant's property eastern boundary, and lies approximately 30-35m from the present edge of quarrying activity. The proposed extension will not encroach on this site. The existing edge of mining activity has come to c. 30m of the western edge of the ringfort. Any associated field systems or enclosures to the west or north/west of the fort will already have been removed by previous mining activities. Nonetheless, the site itself, and the remaining area which surrounds it are considered to be of archaeological significance.

2.68 The second ringfort lies within a field which is separated from the north-eastern spoil dump by an established field boundary. This ringfort is also within the landholding of the applicant. The proposed mine extension will not encroach on this site.

2.69 No Protected Structures (as listed within the Schedules of the Monaghan County Development Plan 2006-2012) lie within or adjacent to the area of proposed development. It is possible that previously unidentified subterranean features associated with the ringfort may lie within and adjacent to the north/eastern boundary of the site. The proposed development will not impact on this feature.

Mine Closure

2.70 The proposed extension of the extraction area / zone at Knocknacran is expected to be in operation for approximately 11 years, which is in line with the original forecast for Knocknacran operations up to 2018 as outlined in PL18/5/67892. After such time it is proposed to decommission the opencast mine.

2.71 The overall aim of the Closure Plan is to ensure that the site is rehabilitated to the highest safety and environmental standards following cessation of operations.

2.72 It is proposed to use the same closure concept for the Knocknacran Extension as the existing Knocknacran Closure plan. The site will be reclaimed to the general land forms shown in Figure DR-303, provided in Appendix 13b

2.73 The closure will be carried out as a phased programme over an agreed timescale until the eventual closure and restoration of the site is complete. The closure of the site will be phased to include the following:

- Removal of all equipment from the mineral extraction area with the exception of the pumping station;
- Site contouring;
- Restoration of topsoil cover, where required
- Grass seeding
- Boundary treatment
- Planting of pioneer species and initial landscaping
- Installation of access where appropriate
- Thinning of pioneer species after 5-7 years. Planting of final cover species
- Removal of pump station to above +45 m O.D. once Drummond underground mine has ceased. Formation of an amenity lake by flooding the void created by mineral extraction

Conclusion

2.74 The proposal for an extension to the opencast mine optimises the use of the gypsum resource and ensures the continued extraction of gypsum in the area, in conjunction with the extraction from the existing underground mine. In particular:

- There is a continuing market demand for gypsum and its associated products.
- The Kingscourt formation is the only practical location in Ireland at present for the extraction of gypsum.
- There is an established gypsum industry in the area and a long history of gypsum extraction and processing.
- The proposed extension will utilise the reserves present at Knocknacran within the applicant's landholding. It is therefore making best use of the location, the facilities and the expertise of the company.
- The proposal conforms to the State Mining Lease held by the company.

- The proposed mining method will allow gypsum to be extracted in a safe manner with the least possible impact on the environment and the least possible disruption to the local community.
- Constant monitoring will ensure the safe operation of the mine and the mitigation of any adverse impacts.
- The proposal will maintain employment.

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