

Assessment of Economic Contribution of Mineral Exploration and Mining in Ireland

Report

Submitted to

**Department of Communications,
Energy and Natural Resources**

Prepared by

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Glossary of Terms and Abbreviations

Exploration	Mineral exploration is the process of finding ore (commercially viable concentrations of minerals) to mine. Prospecting is the first stage of search for such minerals.
FTE	Full-Time Equivalent. This is a measure of employment supported which takes into account both persons engaged on a full-time basis and those employed on a part-time basis.
GVA	Gross Value Added. This is a measure equivalent conceptually to Gross Domestic Product (GDP) at national economic level and measures the difference between the value of a firm's output or sales turnover and its expenditures on production inputs.
Mining	Mining is the act, process, or industry of extracting minerals from the earth.
Multiplier	A 'multiplier' is a factor applied in estimating the wider economic impacts of a sector or organisation's activity. This considers the indirect and induced impacts of the sector or organisation. Indirect impacts relate to the additional economic activity supported in sub-supply of input to the sector or organisation. As these indirect impacts supported employment and associated incomes, the re-spending of these incomes elsewhere in the economy gives rise to induced impacts, thereby supporting additional activity and employment. Multipliers are calculated using detailed sectoral data from the Central Statistics Office's National Income Accounts for the Irish economy and input-output analysis of the relationships between economic sectors.

Executive Summary

Introduction and Background

This report is submitted to the Minister for Communications, Energy and Natural Resources by Indecon International Economic Consultants. The report concerns an independent assessment of the impact of the mineral exploration and mining sector on the Irish economy.

The background to this study is the need to have independent sectoral information to support minerals policy. The Minerals Development Acts 1940 to 1999 govern mineral exploration and development in Ireland. Exploration and extraction in the sector are regulated by the Exploration and Mining Division of the Department of Communications, Energy and Natural Resources. A new Minerals Development Bill is currently being drafted, which will consolidate existing exploration and mining legislation as well as updating certain aspects to ensure legislation is in line with best practice. It is within this context that this review is timely in evaluating the economic impact of the sector and to assist in maximising the contribution of the mining and exploration sector, which is an objective set out as part of the Department's overall Statement of Strategy.

Scope of Assessment

The overall objective of this study was to undertake research to independently establish the overall economic contribution of the mining and mineral exploration sector to the Irish economy. This assessment addresses the following aspects:

- ❑ The level of activity/output and Irish economy expenditures in mining and exploration;
- ❑ The extent to which the sector supports Irish jobs and how each job within the sector supports other non-mineral exploration and mining jobs;
- ❑ The tax and other revenues generated for the Exchequer from this sector;
- ❑ The impact of minerals exploration and mining on the wider economy that may not be readily recognisable, including the indirect/multiplier impacts of the sector across the economy; and
- ❑ The direct contribution to GDP and the link to direct value added.

A rigorous methodology was applied in undertaking this assessment, informed by international best practice approaches to economic impact assessment.

Overview of Sector

Mining and exploration in Ireland are currently governed by the Minerals Development Acts 1940 to 1999. These comprise the Minerals Development Act 1940 (the Principal Act) and amending Acts of 1960, 1979, 1995 and 1999. The combined Acts (and regulations made thereunder) outline the definitions of mining and minerals in Ireland, as well as laws governing mining and exploration enterprises. The wider industry in Ireland is divided into two sections: mining and exploration. Mineral exploration, or prospecting, is controlled via Prospecting Licences, which give the holder exploration rights for an area of approximately 35 km² on average and are valid for six years with the possibility of renewal. Mining relates to the extraction of minerals, both on the surface and underground, and is controlled via mining licences and leases, collectively State Mining Facilities (referred to hereafter in the document as mining facilities).

In Ireland, the mining industry is predominantly focused on the mining of zinc and lead. In 2012, Ireland was Europe's largest producer of zinc metal in concentrate (32% of all European zinc mine output, inclusive of the Russian Federation) and the 10th largest producer in the world (2.5% of world output). Ireland was similarly Europe's 3rd largest producer of lead metal in concentrate (13% of European lead mine output, inclusive of the Russian Federation) and 12th largest in the world (1% of world output).

The table below highlights the recent trends in Ireland's output from metal concentrates (zinc and lead) as a percentage of global output and European output. Ireland also produces a significant tonnage of gypsum (approximately 300,000 tonnes in 2012).

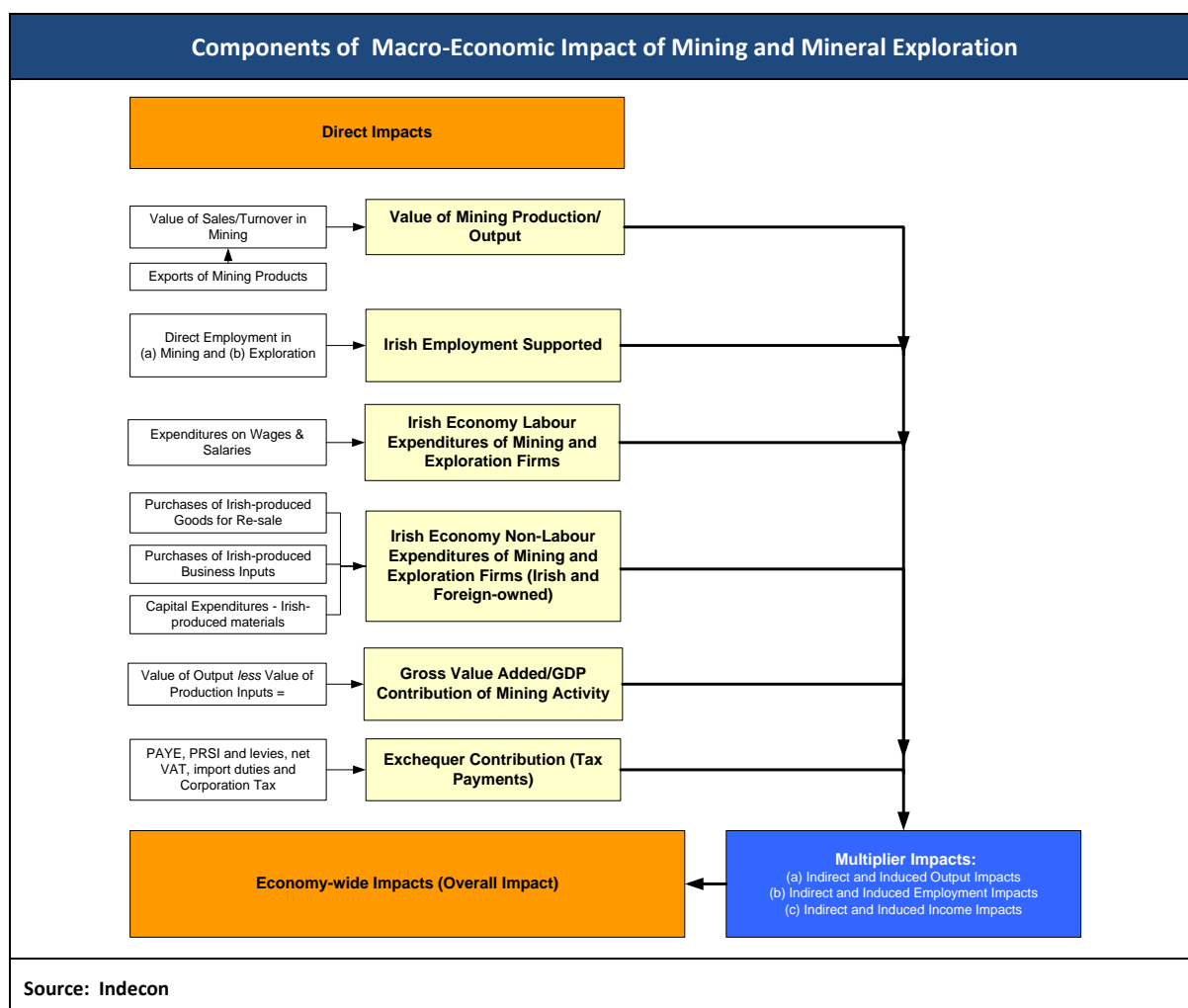
Ireland's share of Global and European Output of Metal Concentrates from Mining Activity 2007-2012						
	2007	2008	2009	2010	2011	2012
Zinc						
Percentage Share of Global Zinc Output	3.5%	4.0%	3.4%	3.0%	2.6%	2.5%
Percentage Share of European Zinc Output	38.0%	38.0%	38.0%	32.0%	32.0%	32.0%
Lead						
Percentage Share of Global Lead Output	1.5%	1.2%	1.3%	1.0%	1.0%	1.0%
Percentage Share of European Lead Output	19.7%	16.0%	15.0%	11.0%	14.0%	13.0%
Source: Data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011.						

Components of economic impact

Prior to undertaking analysis of the impacts of mining and exploration activity on the Irish economy, consideration must be given to the linkages and channels through which the direct and indirect impacts take place and how they are measured. The schematic overleaf provides a description of the components of the direct and indirect impacts which are captured in this assessment. The key measurable outcomes of the direct and indirect impacts are as follows:

- ❑ Mining sales turnover as a value of mining production / output;
- ❑ Persons employed in mining and exploration as a measure of Irish employment supported by the sector;
- ❑ Wages and salaries earned in mining and exploration as a measure of Irish economy labour expenditures of mining and exploration firms;
- ❑ Gross value added of mining output as a measure of the GVA contribution of mining; and
- ❑ Tax payments as a measure of the exchequer contribution of the sector.

Indecon's estimates for each of the above components are summarised overleaf and are examined in detail in Sections 3 and 4 of this report.



Summary of Findings from Assessment

The table overleaf presents an overall summary of the main components of the overall economic impact of the mineral exploration and mining sector in Ireland, showing the direct as well as economy-wide impacts. The key areas of impact of the sector across the economy are employment, sales turnover, expenditure, gross value added, as well as contributions to the Exchequer and to local communities. The following are the key findings from the assessment:

- ❑ Output in mining, as measured by sales turnover, amounted to €426.1 million in 2012;
- ❑ The activities of exploration and mining companies supported 1,373 full-time equivalent persons during 2012, while an additional 1,933 FTEs were supported indirectly as a result of multiplier impacts throughout the economy;
- ❑ One of the features of the industry is the broad regional distribution of its workforce, with significant numbers of people employed in the Mid-East, Mid-West and South-East, as well as across other regions in the West and South-West;
- ❑ Total direct expenditure on wages and salaries for workers in exploration and mining amounted to €107.3 million in 2012. These expenditures also result in multiplier impacts throughout the economy, bringing the overall income impacts in the wider economy to an estimated €341 million in 2012;

- ❑ Total expenditures by exploration and mining companies amounted to an estimated €313.2 million during 2012. The combined direct, indirect and induced impacts of these expenditures is estimated at €809.7 million;
- ❑ The overall Gross Value Added contribution of the mining sector to the Irish economy is estimated at €274.0 million in 2012;
- ❑ Exploration and mining companies contributed a total of €56.6 million in tax and other payments to the Exchequer and to local authorities during 2012. In addition, the State benefits from payments made by mining and prospecting licence holders in the form of royalties, licence fees and other payments. These receipts amounted to €10.6 million in 2011 and €9 million during 2012; and
- ❑ In addition to creating and supporting jobs and expenditures at local level in Ireland, exploration and mining companies also contribute to local communities in the form of financial supports to community sporting and other organisations. According to the findings of Indecon's research, mining and prospecting companies contributed a total of almost €460,000 to local community activities and organisations during 2012.

Summary of Components of Economic Impacts of Mineral Exploration and Mining Sector in Ireland	
	Estimates for 2012
Employment Supported (Mining and Exploration)	
Direct Employment – Full-Time Equivalent Persons (FTEs)	1,373
Indirect and Induced Employment Supported (FTEs)	1,933
Economy-wide Employment Supported (FTEs*)	3,306
Sales Turnover (Mining)	
Value of Sales Turnover - € Million	€426.1
Expenditures (Mining and Exploration)	
Direct Expenditure on Wages and Salaries - € Million	€107.3
Total Mining and Exploration Expenditure - € Million	€313.2
Economy-wide Expenditure Impact - € Million*	€809.7
Gross Value Added (Mining)	
Gross Value Added - Mining - € Million	€274.2
Exchequer, Local Authorities and Local Communities (Mining and Exploration)	
Exchequer Contributions (including Local Authority rates etc) - € Million	€56.6
Other Income to the State (Royalties, Licence Fees, etc.) - € Million	€9.0
Financial Contributions to Local Communities - € Million	€0.459
Source: Indecon analysis	
* Economy-wide impacts represent the indirect and induced multiplier impacts arising from the estimated direct impacts.	

Overall Conclusions

The evidence suggests that the economic value added contribution of the mining and mineral exploration industry to the Irish economy is considerable and far-reaching. The nature of the impact of the sector was evaluated through examining components such as employment, wages and salaries, non-labour and capital expenditures, contributions to the Exchequer in the form of taxes and payments to local authorities, and local community contributions. Of particular importance is the substantial number of jobs supported both directly and indirectly by mining and exploration activities, especially in the context of the high unemployment rates prevailing across many sectors of the economy at this time. The workforce in the mining industry is broadly distributed across the regions, with significant numbers of people employed in the Mid-East, Mid-West and South-East, as well as across other regions in the West and South-West.

1 Introduction, Background and Approach

1.1 Introduction

This report is submitted to the Minister for Communications, Energy and Natural Resources by Indecon International Economic Consultants. The report concerns an independent assessment of the impact of the mineral exploration and mining sector on the Irish economy.

1.2 Background and Context

The background to this study is the need to have independent sectoral information to support minerals policy. The Minerals Development Acts 1940-1999, govern mineral exploration and mining in Ireland. Exploration and extraction in the sector is regulated by the Exploration and Mining Division of the Department of Communications, Energy and Natural Resources. The Minister of Communications, Energy and Natural Resources is also responsible for the development of mineral policy and the promotion of the sector. Exploration is carried out in licenced areas across Ireland and mining is undertaken under lease or licence (collectively State Mining Facilities or mining facilities) granted by the Minister over specific deposits. The Minerals Development Acts cover a range of minerals but exclude stone, sand, gravel, clay, and petroleum and natural gas, which are not part of this study. The purpose of this study is to analyse the economic contribution of the exploration and mining sector.

A new Minerals Development Bill is currently being drafted, which will consolidate existing exploration and mining legislation as well as update certain aspects to ensure legislation is in line with best practice. It is within this context that this review is timely in evaluating the economic impact of the sector and assisting in maximising the contribution of the mining and exploration sector, which is an objective set out as part of the Department's overall Statement of Strategy.

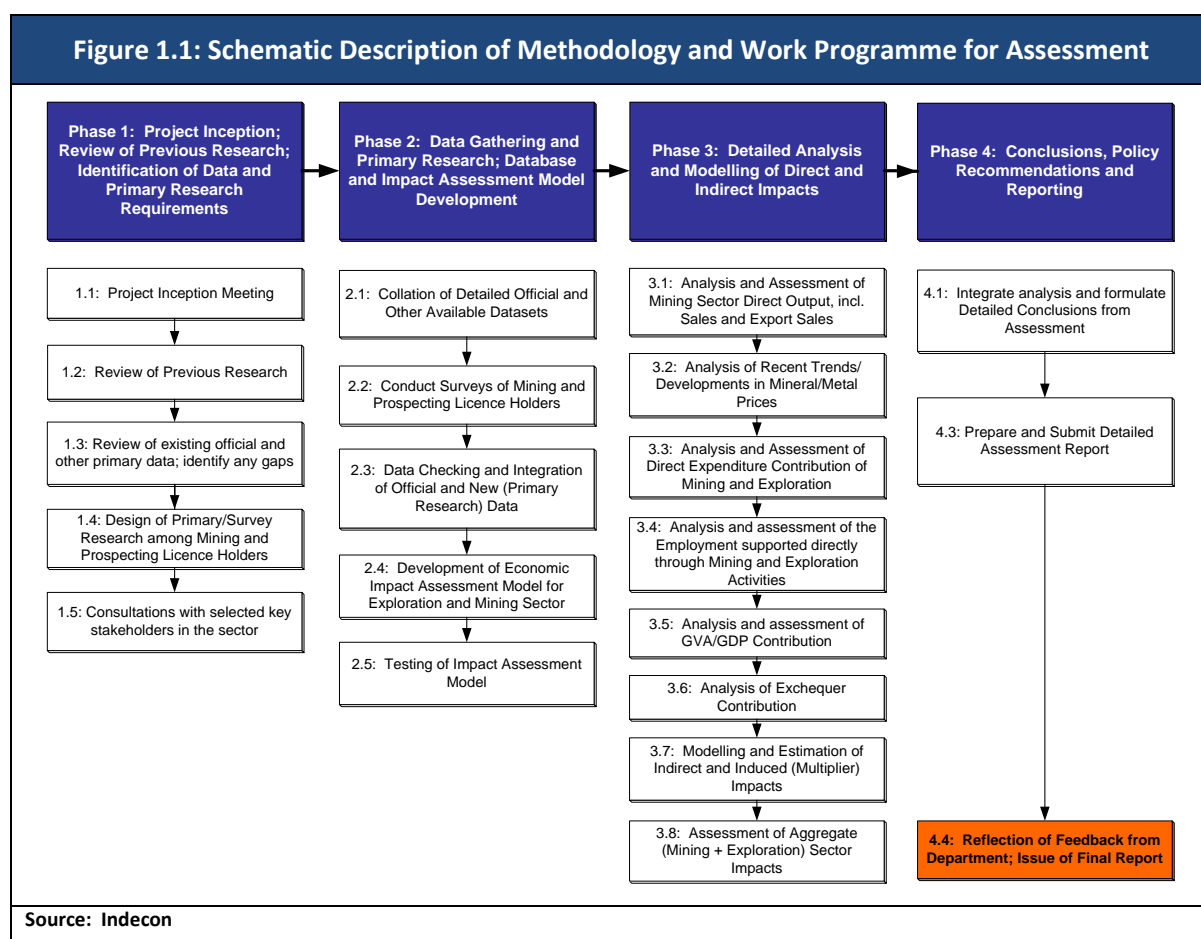
1.3 Scope and Terms of Reference

The overall objective of this study is to undertake research to independently establish the overall economic contribution of the mining and mineral exploration sector to the Irish economy. This assessment addresses the following aspects:

- ☐ The level of activity/output and Irish economy expenditures in mining and exploration;
- ☐ The extent to which the sector supports Irish jobs and how each job within the sector supports other non-mineral exploration and mining jobs;
- ☐ The tax and other revenues generated for the Exchequer from this sector;
- ☐ The impact of mineral exploration and mining on the wider economy that may not be readily recognisable, including the indirect/multiplier impacts of the sector across the economy; and
- ☐ The direct contribution to GDP and the link to direct value added.

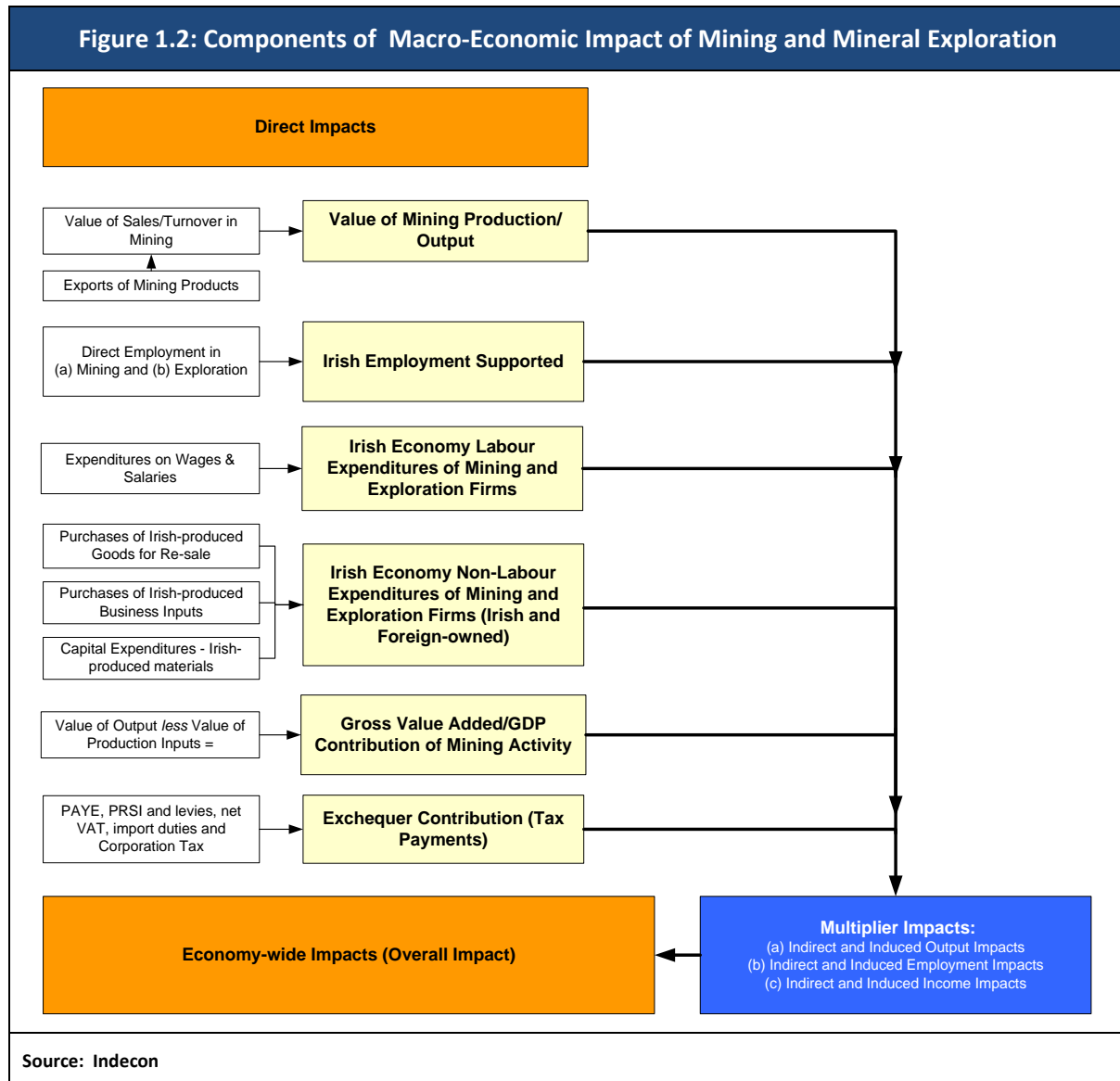
1.4 Methodology

A schematic overview of the methodology and work programme for this assessment is presented in the figure below. A rigorous methodology was applied in undertaking this assessment, informed by international best practice approaches to economic impact assessment. This was supported by a clear conceptual framework for capturing the direct, indirect and economy-wide impacts of mining and exploration activities, which is discussed further below.



1.4.1 Conceptual framework: components of economic impact

Prior to undertaking analysis of the impacts of mining and exploration activity on the Irish economy, consideration must be given to the linkages and channels through which the direct and indirect impacts take place and how they are measured. The schematic overleaf provides a description of the components of the direct and indirect impacts which are captured in this assessment.



As in the case of any assessment of economic impact at sector/industry level, it is important that caution is exercised in interpreting results. All economic activities will generate impacts. However, these activities give rise to associated opportunity costs of resource utilisation. In the context of this study, this means that if the mineral exploration and mining industry did not exist, the reduction in economic activity would not equate with the impacts shown.

1.4.2 Data sources

A range of data sources has been accessed to inform the analysis in this study, including:

- ☐ Data from Department of Communications, Energy and Natural Resources, including:
 - Data on number and location of prospecting licences and mining facilities;
 - Annual reports on the sector produced by the Department, including six-monthly reports by the Minister under Minerals Development Acts, and data on exploration expenditures based on returns of licence holders; and
 - Detailed descriptive data on mining and exploration sector.
- ☐ Central Statistics Office (CSO) data:
 - Census of Population, Occupations data, including breakdown of employment in mining or metal ores.
- ☐ London Metal Exchange:
 - Lead and Zinc price data.

1.4.3 Primary research

As part of the detailed research undertaken for this assessment, Indecon issued confidential information requests/surveys to both mining and prospecting licence holders, with the objective of identifying information on the following aspects:

- ☐ Employment in mining and exploration, and related support functions;
- ☐ Revenues from mining activities;
- ☐ Export sales in mining;
- ☐ Expenditures in mining and exploration, including labour and non-labour, and capital expenditures on Irish-produced goods and services inputs, and R&D expenditures;
- ☐ Tax payments;
- ☐ Payments to Local Authorities;
- ☐ Contribution to local communities; and
- ☐ Views on future opportunities for mining and mineral exploration in Ireland.

The research was divided into three separate channels, namely:

- ☐ Survey of Mine Operators;
- ☐ Survey of Prospecting Licence Holders; and
- ☐ Survey of Mine Operators who also hold Prospecting Licences.

Copies of the questionnaires used for each survey stream are provided in Annex 1 of this report. A breakdown of the responses received to each survey stream is provided below. A total of 18 respondents completed the survey. Thirteen of these were prospecting licence holders only. Two respondents were mining licence holders only while a further two held both mining and prospecting licences. These four companies cover the four main operational mines in Ireland. One mining consultancy also responded.

Table 1.1: Breakdown of Survey Respondents by Type of Licence Held

Licence Type	Number of Respondents
Mining	2
Prospecting	13
Mining & Prospecting	2
Mining Consulting	1
Total	18
Source: Indecon Confidential Survey of Mining Licence Holders and Prospecting Licence Holders	

Indecon's survey of prospecting-only licence holders represents a sample of the population of prospecting licence holders. Grossing-up procedures were applied to the sample data on key variables such as employment and expenditure to enable estimation of the impacts across the population of licence holders. This utilised Department of Communications, Energy and Natural Resources data on total exploration expenditure in combination with the relationships implied by the findings from the survey research among prospecting licence holders.

1.5 Report Structure

The remainder of this report is structured as follows:

- Section 2 sets the context for the assessment by providing an overview of the mineral exploration and mining sector in Ireland, commencing with a review of the legislative context and examining aspects such as the numbers of exploration/prospecting licences and mining facilities issued, and the number of operating companies. This section also sets Irish mining and exploration activities in the context of wider global developments;
- Section 3 assesses the direct economic impacts of mineral exploration and mining in Ireland, including in relation to output/production, employment supported, sales and exports, expenditures, including spend on Irish-produced goods and services labour and non-labour inputs, capital expenditures and other expenditure associated with mining and exploration activities. We also estimate the overall contribution of mining activities to Irish economy value-added/GDP, and the contribution of the industry to the Exchequer in the form of tax payments;
- Section 4 examines the multiplier impacts of the direct activities measured in Section 3, through estimating the indirect and induced, and overall impacts of mineral exploration and mining across the Irish economy; and
- Section 5 integrates the detailed elements undertaken in the preceding sections to present a summary of the overall findings of the assessment, in addition to discussing the future opportunities for the development of the mineral exploration and mining sector in Ireland.

1.6 Acknowledgments and Disclaimer

Indecon would like to acknowledge the inputs and assistance provided by a number of individuals in the compilation of this report. We would particularly like to express our gratitude to senior officials within the Department of Communications, Energy and Natural Resources, including Frank Sheridan, Dr Eibhlin Doyle, Brian Breslin, Diarmuid O'Connor, Ray Treacy and Evin McMahon for their guidance and inputs. We would also particularly like to thank individual mining and exploration companies, including members of the Irish Mining and Exploration Group within IBEC, who confidentially provided inputs and views to Indecon in response to our information requests/surveys. In addition, we would particularly like to thank Professor Philip Crowson, who provided conceptual and other research inputs. The usual disclaimer applies and the analysis and findings in this independent report are, however, the sole responsibility of Indecon.

2 Overview of Mining and Exploration Industry in Ireland

2.1 Introduction

This section sets the context for the assessment by providing an overview of the mineral exploration and mining sector in Ireland. This commences with an overview of the legislative context and definition of the sector. A description of the numbers of mining and exploration/prospecting licences issued, and the number of operating companies, is then presented. This section also sets Irish mining and exploration activities in the context of wider global developments, by reference in particular to world output and price developments.

2.2 Legislative Context and Definition of Sector

Exploration and mining in Ireland are governed by the Minerals Development Acts 1940 to 1999. These Acts combined outline the definitions of mining and minerals in Ireland, as well as laws governing mining and exploration enterprises. A new Minerals Development Bill is currently being drafted by the Government.

Minerals, as defined in the Minerals Development Acts, include all substances in, on, or under land other than:

- ❑ the agricultural surface of the ground;
- ❑ turf or peat; and
- ❑ stone, sand, gravel or clay (except for substances included in the Schedule to the 1940 Act).

It should also be noted that separate arrangements exist for regulation of petroleum exploration and development (under the Petroleum and Other Minerals Development Act 1960).

Mining

The industry in Ireland is divided into two sections: exploration and mining. Mining refers to the extraction (or working) of minerals. The exclusive right to work minerals, regardless of ownership, is vested in the Minister under the Minerals Development Act 1979 (with the exception of a very small number of mines that were in operation in 1978). Mining, therefore, requires a permit from the Minister. This can be either a State Mining Lease under the Minerals Development Act 1940 for minerals in State ownership, or a State Mining Licence under the 1979 Act for privately-owned minerals. It is estimated that about 60% of minerals in Ireland are State-owned. A State Mining Permission can also be issued for very small tonnages of State-owned minerals for limited periods of time, but this procedure is rarely used. These three types of permits are collectively referred to as State Mining Facilities or mining facilities. The primary minerals currently being mined in Ireland include zinc, lead, and gypsum, with smaller quantities of other minerals.

Exploration/prospecting

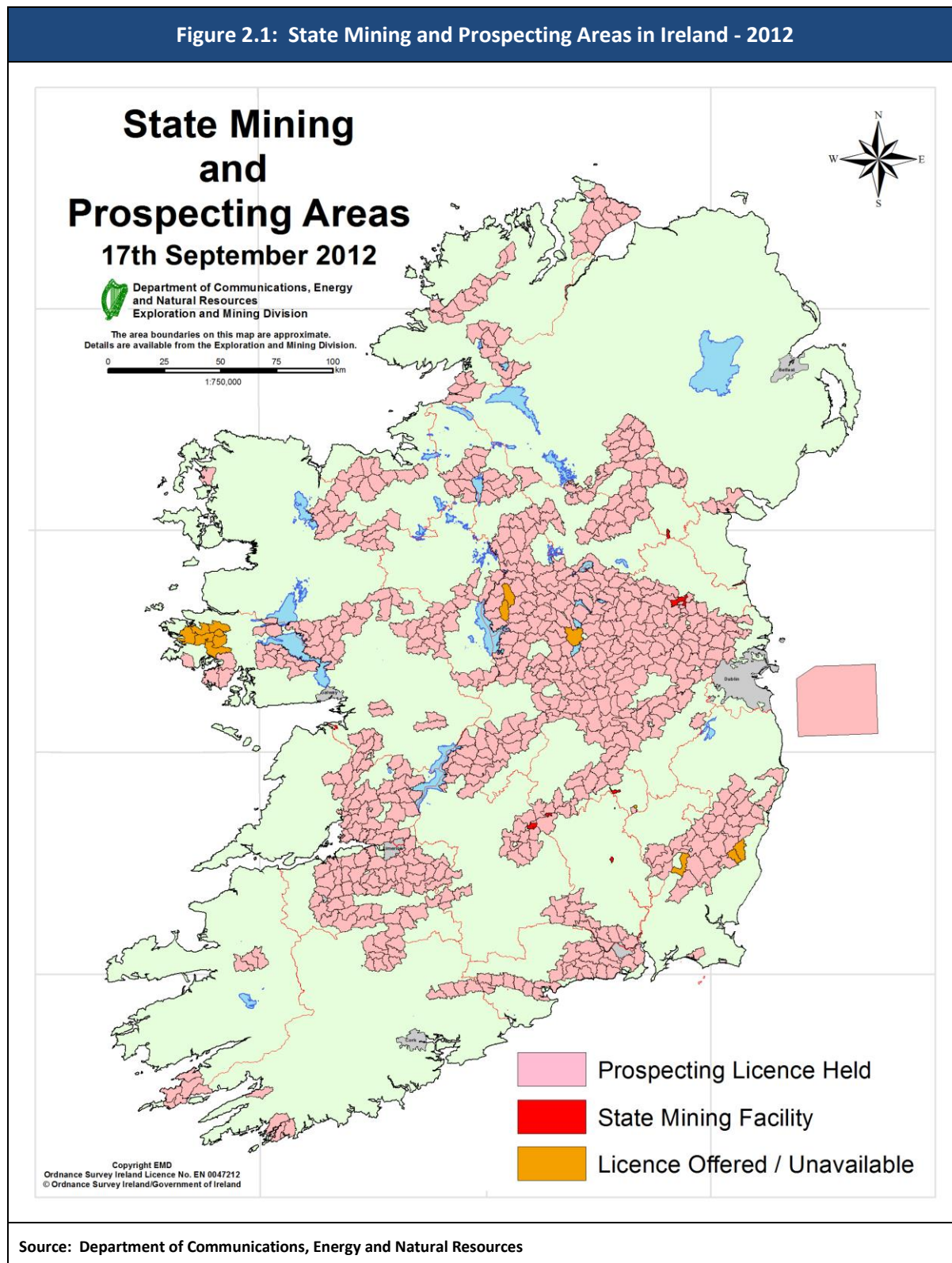
Mineral exploration (also called 'prospecting') is also governed under the Minerals Development Acts. Exploration in Ireland is controlled via Prospecting Licences, which give the holder exploration rights for an area of approximately 35 km² on average and are valid for six years with the possibility of renewal. Prospecting Licences are available for the following areas:

- ❑ Open areas: Areas available for licence applications generally considered on a "first-come, first-served basis".
- ❑ Incentive areas: Areas which have never been licensed (open ground) or open areas which have not been licensed for over four years. Incentives exist in the form of reductions in consideration fees and also reduced exploration expenditure requirements to encourage exploration of these areas which are deemed to be under-explored.
- ❑ Competition areas: Areas for which an existing licence has recently lapsed. A competition list for these areas is drawn up four times per year, and applications made within the subsequent two months are considered on merit.

A Prospecting Licence gives the holder the right to explore for the particular minerals specified in the licence. Only holders of current licences are considered for State Mining Facilities to develop such minerals within the licence area, whether the minerals are State-owned or privately-owned. There are currently 2,021 delineated prospecting licence areas in Ireland. A map showing active State mining and prospecting areas as of September 2012 is presented in the figure overleaf.

In summary, the mineral exploration and mining industry in Ireland centres on the exploration and mining of minerals, where the definition of minerals excludes petroleum, stone, gravel, sand and clay.

Figure 2.1: State Mining and Prospecting Areas in Ireland - 2012



2.3 Overview of Current Mineral Exploration and Mining Activity

Recent developments in number of prospecting licences

The table below summarises the numbers of applications received annually since 2007. The number of applications fell sharply from 182 applications in 2007 and 128 in 2008, to just 29 applications in 2009, but rose in 2010 (76 applications) and again in 2011 (to 148 applications). A total of 115 applications was received during 2012. The large annual movements in licence application activity reflect the often volatile nature of exploration activity. The level of prospecting is likely to be strongly related to metal prices and the number and size of recent finds. A small number of significant finds can therefore lead to a large increase in prospecting.

Table 2.1: Applications for Prospecting Licences Received, 2007 – 2012	
Year	Applications Received
2007	182
2008	128
2009	29
2010	76
2011	148
2012	115
Source: Exploration and Mining Division, Department Communications, Energy and Natural Resources	

The table below indicates the overall numbers of Prospecting Licences granted annually since 2007. The number of Prospecting Licences granted has also fluctuated, though by less than the number of licence applications.

Table 2.2: Prospecting Licences Granted, 2007 – 2012	
Year	Licences Granted
2007	143
2008	91
2009	66
2010	93
2011	98
2012	102
Source: Exploration and Mining Division, Department Communications, Energy and Natural Resources	

Prospecting Licences are normally granted for a period of six years, with the option of renewal available if all conditions have been met by the exploration company throughout the duration of the licence. It is also informative to consider the number of licences held in each year for the period 2007 to 2012, and these figures are presented in the table below. There has been a recent growth in the number of licences held, with the total number of licences held increasing from 373 in 2007, to 589 by the end of 2012. These figures suggest a recent strong increase in the level of interest in mineral exploration in Ireland.

Table 2.3: Prospecting Licences Held, 2007 – 2012	
Year	Licences Held at end of Year
2007	373
2008	484
2009	477
2010	501
2011	517
2012	589
Source: Exploration and Mining Division, Department Communications, Energy and Natural Resources	

It is also instructive to consider Prospecting Licences in terms of the type of exploration they allow. The following table comprises a list of minerals for which Prospecting Licences exist.

Table 2.4: List of Minerals included in Prospecting Licences, June 2012

Mineral
Antimony
Barytes
Base Metals
Beryllium
Caesium
Calcite
Coal
Cobalt
Diamonds
Dolomite and Dolomitic Limestone
Fireclay
Fluorite
Gem Minerals
Gold
Iron
Lithium
Manganese
Molybdenum
Niobium
Platinum Group Metals
Rare Earth Elements
Rubidium
Silica Sand
Silver
Tantalum
Tin
Tungsten
Zircon
Source: Department of Communications, Energy and Natural Resources, Report by the Minister for Communications, Energy and Natural Resources for the Six Months Ended 30 June 2012.

The vast majority of prospecting licences do not exist for single minerals alone but generally cover a number of minerals. The exploration of base metals such as lead and zinc are most commonly included in Prospecting Licences.

Recent developments in Number of State Mining Licences/Leases

As indicated previously, regardless of ownership, mining in Ireland requires a licence, lease or permission granted by the Minister for Communications, Energy and Natural Resources. The table below indicates the number of State Mining Licences and Leases on issue over the period 2009-2012. There are currently 10 active State Mining Leases and nine State Mining Licences, compared with totals of 22 in both 2010 and 2011, and 20 in 2009.

Table 2.5: Number of State Mining Licences/Leases Held – 2009-2012	
Year	Total Number of State Mining Licences/Leases Held - End of Year position
2009	20
2010	22
2011	22
2012	19
Source: Department of Communications, Energy and Natural Resources	

The above figures pertain to the overall number of mining facilities in issue. The output from mining in Ireland is concentrated in a very small number of operations, with a total of three important mines in operation at the end of 2012 (see table below).

Table 2.6: Number of Major Operating Mines in Ireland – 2009-2012	
Year	Total Number of Major Operating Mines – End-year
2009	4
2010	4
2011	4
2012	3*
Source: Department of Communications, Energy and Natural Resources	
Note: While small in output, there are a number of other mines in operation in addition to those included in this table.	
* Galmoy mine closed in October 2012.	

The locations of the significant mines in operation in 2012, as well as their production companies and output products, are provided in the table overleaf. This report, *inter alia*, considers the economic impacts arising from the operations of these mines. Due to low zinc prices, a decision was made in 2009 to close the Galmoy mine, but to continue the extraction of ore for processing at the nearby Lisheen mine. Galmoy mine ceased its operations in October 2012, when the mine went into full Mine Closure and Rehabilitation mode.¹

¹ Lundin Mining, *Operations and Development – Galmoy Ireland* (see <http://www.lundinmining.com/s/Galmoy.asp>.)

Table 2.7: Main Operational Mines in Ireland

Location of Mine	Production Company	Output Product
Navan, Co. Meath	Boliden Tara Mines	Zinc, Lead
Lisheen, Co. Tipperary	Vedanta Resources Plc	Zinc, Lead
Galmoy, Co. Kilkenny	Galmoy Mines Ltd.	Zinc, Lead
Knocknacran and Drummond, Co. Monaghan	Irish Gypsum Ltd.	Gypsum
Source: Department of Communications, Energy and Natural Resources Note: While small in output, there are a number of other mines in operation in addition to those included in this table. Galmoy Mines Ltd. is a subsidiary of Lundin Mining Corporation. Galmoy Mine is at present in closure mode. Irish Gypsum Ltd is a subsidiary of Saint Gobain. These two mines operate under one consolidated lease.		

2.4 Trends in Mining Output in Ireland

In Ireland, the mining industry is predominantly focused on the mining of zinc and lead. In 2012, Ireland was the largest European producer of zinc metal in concentrate (32% of European zinc mine output, inclusive of the Russian Federation) and the 10th largest producer in the world (2.5% of world output). Ireland was similarly the 3rd largest producer of lead metal in concentrate in Europe (13% of European lead mine output, inclusive of the Russian Federation) and 12th largest in the world (1% of world output).²

The table below shows the trend in Ireland's output of zinc and lead metal in concentrate as a percentage of global output and European output from 2007 to 2012.

Table 2.8: Ireland's share of World and European Output of Metal Concentrates from Mining Activity 2007-2012

	2007	2008	2009	2010	2011	2012
Zinc						
Percentage Share of Global Zinc Output	3.5%	4.0%	3.4%	3.0%	2.6%	2.5%
Percentage Share of European Zinc Output	38.0%	38.0%	38.0%	32.0%	32.0%	32.0%
Lead						
Percentage Share Global Lead Output	1.5%	1.2%	1.3%	1.0%	1.0%	1.0%
Percentage Share European Lead Output	19.7%	16.0%	15.0%	11.0%	14.0%	13.0%
Source: Data from Department of Communications, Energy and Natural Resources						

² Source: Department of Communications, Energy and Natural Resources (2012) "Ireland: Exploration and Mining News – 1st May 2012".

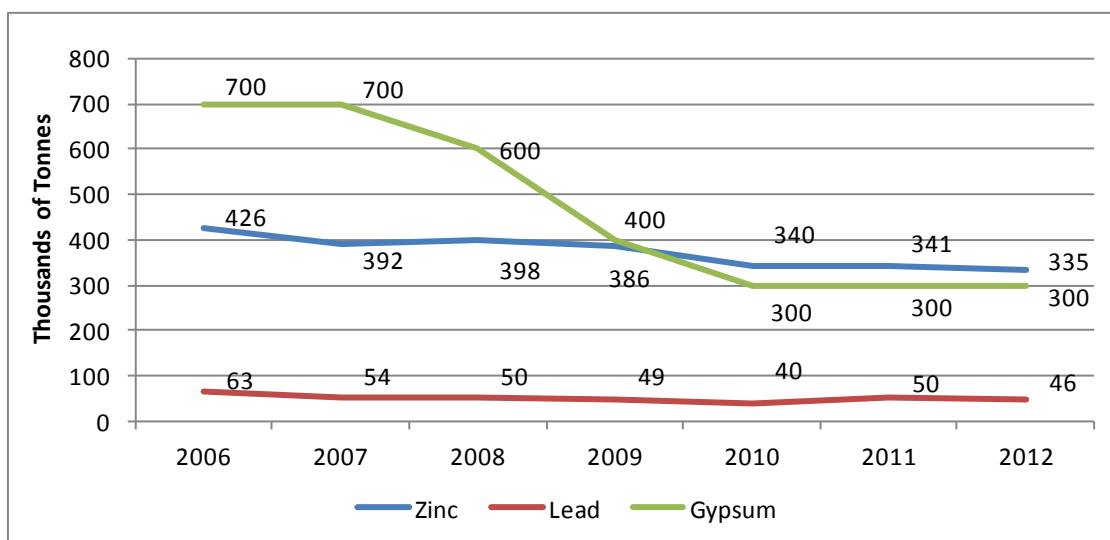
From 2007 to 2009, Ireland's output of zinc metal in concentrate accounted for 38% of total European output and this share has fallen to 32% since 2010. Of the total global output of zinc over the same period in question, Ireland's share peaked at 4% in 2008 and has declined to below 4% since 2009. The State's share of European lead metal in concentrate output declined year-on-year from almost 20% in 2007 to 11% in 2010 but improved again in 2011 to 14%. Ireland's share of the global output of lead has remained at about 1% since 2008.

The table below summarises the trends in actual zinc, lead and gypsum output over the period 2006 to 2012. Official figures estimate that Ireland produced over 337,000 tonnes of zinc metal in concentrate, 47,400 tonnes of lead metal in concentrate and 300,000 tonnes of gypsum during 2012.

Table 2.9: Zinc, Lead and Gypsum Output							
	2006	2007	2008	2009	2010	2011	2012
Zinc Output (Thousands of Tonnes)	426	392	398	386	340	341	337.5
Lead Output (Thousands of Tonnes)	63	54	50	49	40	50	47.4
Gypsum (Thousands of Tonnes)	700	700	600	400	300	300	300
<i>Source: Department of Communications, Energy and Natural Resources, Exploration and Mining Division.</i>							

Figure 2.2 depicts the recent trends in the volume of mining output for the primary ores between 2006 and 2012. Zinc production in Ireland has been consistently much higher than lead production. Overall, official figures indicate that zinc mine output declined by 21% between 2006 and 2012 while lead mine output declined by 27%. Output of gypsum in Ireland declined significantly between 2007 and 2010, from 700,000 tonnes to 300,000 tonnes (reflecting the collapse in the construction sector), but has remained stable since.

Figure 2.2: Trend in Lead, Zinc and Gypsum Output 2006-2012



Source: Indecon analysis based on data from Department of Communications, Energy and Natural Resources

Note: 2012 data are estimates.

It is also informative to consider production at each of the zinc and lead mines in Ireland in 2011. The figures presented in the table below are not comparable with those provided in Table 2.9 above; the table above measures output in terms of metal concentrates, while the table below considers the amount of ore extracted and its respective grade. Once extracted, the ore is milled and processed in order to produce the zinc and lead concentrates. The process does not recover 100% of the contained metal. For this reason, extracted ore yields smaller quantities of concentrates; for example, the ore extracted from the Lisheen mine yielded 265kt of zinc metal in concentrate and 34kt of lead metal in concentrate.

Table 2.10: Ore and Grade of Zinc and Lead by Mine, 2011

Mine	Extracted Ore (Mt)	Grade
Navan (Boliden Tara Mines)	2.5	7% Zn, 1.4% Pb
Lisheen (Vedanta Resources Plc)	1.4	11.7% Zn, 2.2% Pb
Galmoy (Galmoy Mines Ltd.)	0.29	22.5% Zn, 7.4% Pb

Source: Department of Communications, Energy and Natural Resources

Gypsum is extracted by Irish Gypsum Ltd at its underground mine at Drummond, and on surface at Knocknacran, which are situated near to each other in Co. Monaghan. In 2011, these mines produced approximately 300kt of gypsum.

In addition to the trend in volume of output of metal production in Ireland it is also useful to consider the trend in the actual gross value of metal output. The trend in the total gross value of zinc and lead output (combined) for 2006 to 2011 is shown in Table 2.11 below. The gross value of zinc and lead production declined between 2006 and 2009, but recovered in 2010 and 2011. The increase in the combined value of these outputs in 2010 and 2011 occurred despite some reductions in tonnage.

Table 2.11: Gross Value of Lead and Zinc Production in Ireland 2006-2011 - € Million						
	2006	2007	2008	2009	2010	2011
Overall Gross Value of Lead and Zinc Production	731	676	340	329	400	499
Source: Department of Communications, Energy and Natural Resources						

2.5 Trends in Exploration

Exploration is vital in order to determine where future mines might be developed and to determine new sources of minerals, particularly at the current stage of the life of the existing mines. The following table provides an indication of recent exploration work undertaken by exploration companies in Ireland. It should be noted that the exploration companies highlighted below are at different stages of exploration. Some of the companies have made mineral discoveries but have yet to determine the extent of the deposits or to estimate total quantities of mineral available. However, Xstrata Zinc has discovered an estimated resource of 30Mt grading 7% Zn and 1% Pb.

Table 2.12: Recent Exploration Highlights		
Exploration Company	Location of Discovery	Mineral Found
TILZ Minerals Ltd (formerly Limerick Zinc Ltd.)	Stonepark, Co. Limerick	Zn, Pb
Xstrata Zinc	Pallas Green, Co. Limerick	Zn, Pb
Lundin Mining Exploration Ltd.	Kilbricken, Co. Clare	Zn, Pb, Ag, Cu
Lundin Mining Exploration Ltd.	Lakelands, Co. Leitrim	Zn, Pb
Conroy Gold Ltd	Clontibret, Co. Monaghan	Au
IMC Exploration Ltd.	Co. Wexford	Au
Source: Department of Communications, Energy and Natural Resources		
Note: TILZ Minerals is a joint venture between Teck Ireland Ltd. and Connemara Mining Co. Plc		

2.6 Global Mining Trends

2.6.1 Overview

It is instructive to consider global mining trends in order to place Ireland's mining industry in context. The global mineral industries appeared to be only mildly affected by the 2008 financial crisis and the subsequent recession of 2009. Strong growth in Chinese usage sustained demand and prices of most products even as demand stagnated or eased back in Europe, Japan and North America. For many products, China's share of global demand exceeds that of the United States and China has become the major consumer. For example, China accounted for 88% of the growth of global steel output in the 2000's, 81% of the increase in aluminium consumption and 135% of the rise in copper usage, (meaning that demand actually fell outside China in the last decade).

Whilst China will remain the main driver of global minerals demand, it is unlikely to continue experiencing the rapid growth rates of the past decade in which its demand for many products rose much faster than its real GDP. There are increasing indications during 2013 that the pace of Chinese economic expansion slowing down, while the economy is also re-balancing towards expenditure on domestic consumption rather than capital spending which is more minerals-intensive. It is also facing over-heating in some sectors, environmental constraints and social pressures. Its demand for minerals appears to have eased in recent months.³

Although mining output and prices are influenced by global economic activity, the 2009 recession had only a modest impact. Prices have moved very differently since 2002 than in the preceding decades. In 2012 output grew more slowly than in 2011 and prices of many products dropped back, but remained fairly buoyant.

The location of global demand for primary aluminium has shifted over the past three decades with China showing growing dominance. Other mineral products show similar trends. Different minerals sectors have experienced very different growth rates, depending on the nature of their end uses and the geographical location of their demand. In most sectors demand rose more strongly in the 2000's than in the two preceding decades.

The strong growth in Chinese demand caught the mining industry unawares. The declining trend in prices from the early 1970's had forced a concentration on cost cutting of all types and an avoidance of capital spending on many new projects. In consequence the industry lacked either the spare capacity or the will to respond quickly to rising demand. Even the sharp rise in prices was initially seen as yet another short-term blip on a declining trend. When the industry did eventually respond through rising exploration and capital expenditure it faced a variety of bottlenecks in its supplying industries, which had pared back in the same way as mining companies. Shortages of drilling rigs, spares and equipment of all types, and of skilled labour prevented a rapid response of supply to rising demand. Furthermore, the major companies' initial response to higher prices and profits was to pursue mergers and acquisitions rather than grassroots capital expenditure. The spending on mergers peaked in 2006, but remained high in 2007-08, before being cut short by the financial crisis.

³ For example, China's imports of lead ores and concentrates in the period January to April 2013 were 17.3% lower in volume terms and 14.8% lower in value terms compared to the same period in 2012. Source: China Customs Statistics – see: <http://china-trade-research.hktdc.com/business-news/article/Fast-Facts/China-Customs-Statistics/ff/en/1/1X000000/1X09N9NM.htm>.

Corporate exploration spending peaked in 2008 and fell back sharply in 2009 in response to rising uncertainty and restricted access to finance. The setback was, however, brief and spending has risen to new records in every year since 2009. Much of the rise has been in costs rather than physical exploration activity which has been far more restrained. The geographical distribution of spending, within the rising total, has not changed substantially in the last few years, although the shares of Australia and Canada have declined. Gold continues to account for roughly half the total expenditure, much driven by junior companies. High and rising gold prices, until their recent collapse, have accentuated this trend. Initial estimates are that total exploration spending will drop back somewhat in 2013.

There are lengthy lead times between mineral discoveries and mine development. Once the mining industry had accepted that prices were not going to dip back to their long-established downward trend, initial capital spending was on expansions and projects that were already in the pipeline. Capital expenditure was rising strongly up to 2008 but then eased back. Not only did some sources of finance contract, but uncertainty about future demand and profitability led to projects being temporarily frozen. This was, however, a relatively brief hiatus and spending revived between 2009 and 2012, with stalled projects being revived and new ones started. Towards the end of 2012, however, some major companies, responding to shareholders' concern about low dividends and fears of slower demand growth, cancelled or delayed some of their riskier projects.

Meantime, supply was responding to new investment and the shortfalls between demand and supply were being filled. Markets for most minerals have now moved near to balance and in many cases into surplus. So far that has not greatly influenced prices of most materials as the margins of capacity remain tight. In a few instances, however, prices have come, or are coming, under pressure. The heady rises of the mid 2000's are unlikely to be repeated and prices will most likely gradually ease back closer to the long-run marginal costs of supply. Iron ore and copper are two commodities epitomising this probable trend.

Prices have been primarily influenced by market balances, but speculative investment in minerals as an asset class, in some instances, accentuated the surge in prices and sustained them. The persistence of near-zero interest rates has made investment in physical metals seem attractive. That has been in the expectation that demand will continue to rise steadily and that prices will remain strong. Recent months have seen an erosion of confidence in those expectations. Gold has been the most prominent, but not the only example.

Whereas China has been, and remains, the major source of new demand for minerals, it is no longer content to rely on purchases from overseas mining companies. A developing trend of recent years has been the growth of direct Chinese investment in minerals. Africa has been the main, but by no means the only, focus of such spending. Chinese companies have ostensibly been prepared to invest heavily in infrastructure both to support their mineral projects, but also to facilitate entry into some host countries. Whilst Chinese investors were initially welcomed with open arms, the strings attached to their investment are becoming more apparent and some host countries are becoming rather more discriminating.

Host countries have become much more aggressive towards all mining investments. Strong rises in prices have not translated into concomitantly rising fiscal receipts. Countries keen to attract investors during the lengthy mining industry recession were prepared to offer generous fiscal terms that often included lengthy tax holidays and other concessions. With the subsequent rise in prices these terms appeared unduly generous. There has been a worldwide tendency for mineral rich countries to impose additional taxes and royalty rates and to renegotiate the terms of mining

agreements. In some cases there have been calls for partial or complete nationalisation. This resurgent resources nationalism is an inevitable swing of the pendulum. It will almost certainly swing further.

Increased royalties and other fiscal burdens are merely one form of rising costs. Prices peaked in 2008 and profits then rose sharply. Subsequent years have seen strongly rising costs of all types and the gradual erosion of profitability. Whilst prices of energy have fluctuated they remain much higher than a decade ago. Governments were not the only stakeholders to watch rising mineral prices carefully. Wage and salary costs had been forced downwards to the early 2000's, and mining industry employment had declined. The remaining labour force had become gradually older. Labour has inevitably become more militant in recent years keen to regain some of its lost ground and to share in rising prosperity. The mining industry faces continuing shortages of skilled workers at all levels, and these will persist for many years.

In recent decades the mining industry successfully offset the effects of declining ore grades and depletion by technological innovation and by increasing exploitation of economies of scale. The average size of mine rose considerably for all commodities. More recently the scope for further economies of scale appears to have diminished. Mining companies maintain that insufficiently large and potentially low-cost ore deposits have been discovered and are available for development. They argue that there will be many fewer chances of developing large open pit mines and new mines will more likely be underground, with inevitable higher costs. Whether or not this is special pleading remains to be seen. It is, however, unquestionable that many undeveloped ore deposits are in countries with undeveloped infrastructure and high political risks. That means increased capital costs and lengthy delays. The time lag between initial discovery and mine development has, in any case, been lengthening everywhere because of increased permitting and environmental requirements. The social licence to operate has become both more expensive and more difficult to obtain. Such complaints by the mining industry are far from new. What has possibly changed, however, is access to finance. At least in the near term, finance has become both scarcer and more expensive. Financial institutions, and especially banks, have become more risk averse.

Lead and Zinc Trends

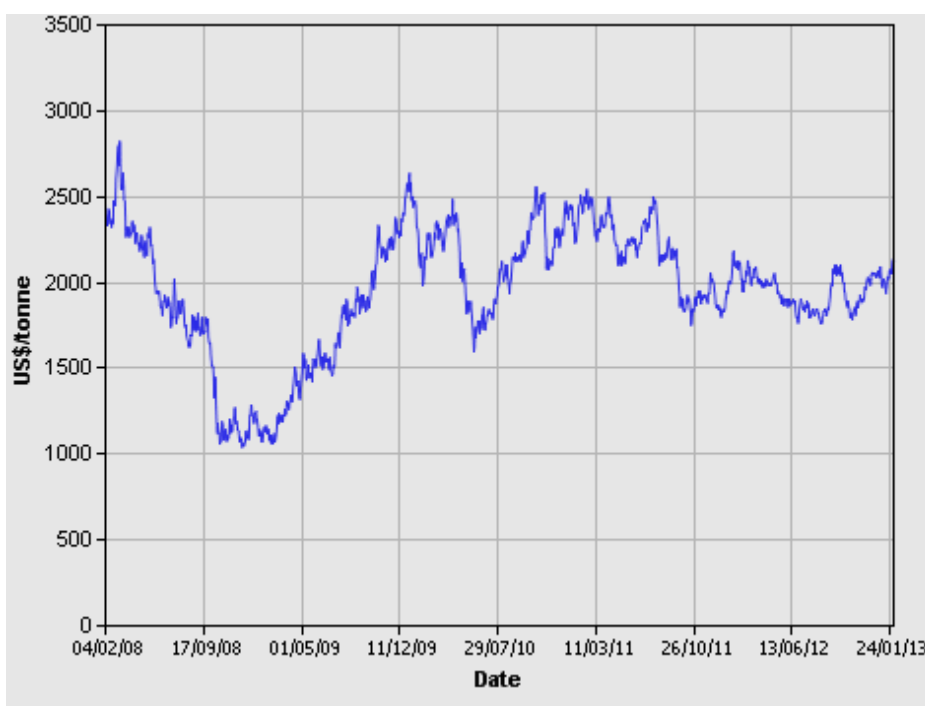
The following table provides global figures of lead and zinc output for the period 2007-2011. Zinc mine output grew steadily from 11,203 kt in 2007 to 12,968 kt in 2011, an increase of 15.7%. Lead mine output also increased over the time period but at a much greater pace, with a 28.2% rise observed between 2007 and 2011.

Table 2.13: World Zinc and Lead Output, 2007 – 2011					
	2007	2008	2009	2010	2011
Zinc Mine Output (Thousands of Tonnes)	11,203	11,885	11,617	12,495	12,968
Lead Mine Output (Thousands of Tonnes)	3,657	3,807	3,834	4,330	4,688
Source: International Lead and Zinc Study Group, Lead and Zinc Statistics. Note: Zinc mine output is defined as "zinc content by analysis of zinc ores and concentrates plus the zinc content of other ores and concentrates known to be intended for treatment for zinc recovery". Similarly for lead mine output.					

Trends in world mineral prices

An important factor to take into account when considering the Irish mining industry in a global context is the movement in the prices of the main metals mined. Prices will impact on the value of sold production and, in turn, impact on value added and expenditures in the economy. Figure 2.3 presents data from the London Metal Exchange in relation to the daily movements in the price of zinc since the beginning of 2008. Zinc prices have been subject to large fluctuations, and like most commodities, suffered substantial falls when the advanced economies entered recession in 2008/09. Zinc prices have been broadly stable in the range of US\$1,800-2,100 per tonne since late 2011.

Figure 2.3: Recent Developments in World Zinc Prices – 2008-2013

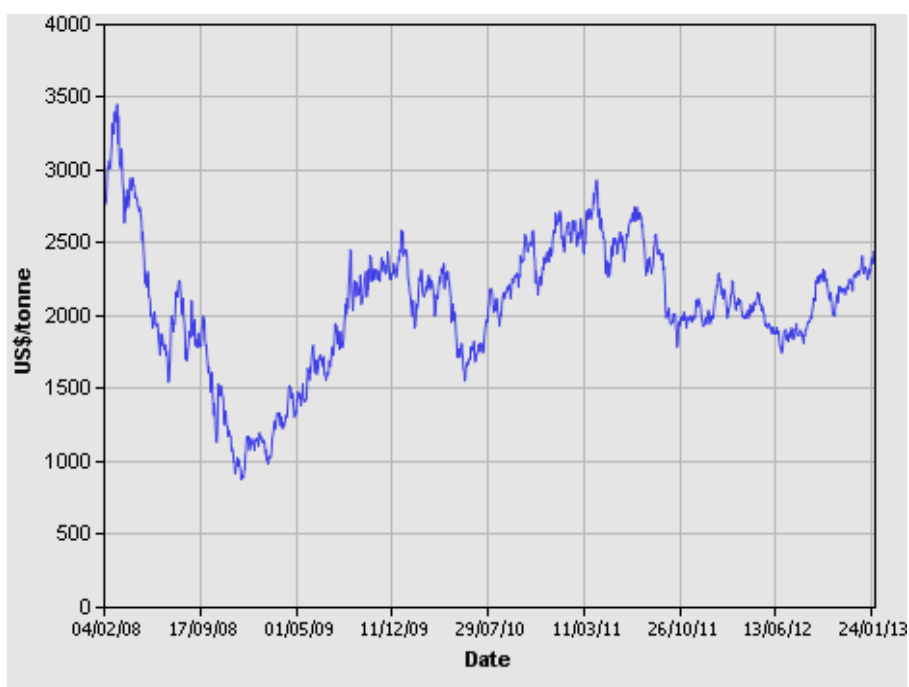


Source: London Metal Exchange

*Price based on price for cash buyers

Figure 2.4 demonstrates the trend in lead prices since 2008. Like zinc prices, lead prices have also fluctuated substantially in the last three to four years, but have traded in the range of US\$1,700-\$2,400 since late 2011.

Figure 2.4: Recent Developments in World Lead Prices – 2008-2013



Source: London Metal Exchange

*Price based on price for cash buyers

While Ireland is a significant producer of zinc and lead in a European context, it remains small in global terms and is therefore a price-taker in the international market. Fluctuations in metal prices will impact on mining returns in Ireland. However, a recovery in the world economy, all else being equal, would be expected to support prices in the medium term, thereby providing support for Irish producers.

3 Assessment of Direct Economic Impacts

3.1 Introduction

This section assesses the direct economic impacts of the mineral exploration and mining sector in Ireland. The analysis includes the following components of the direct economic impact arising from mining and exploration activities:

- ❑ Output in the mining sector and extent of export sales;
- ❑ Direct employment supported by mining and exploration;
- ❑ Expenditures undertaken by prospecting licence and mining facility holders, including on wages and salaries, and on non-labour inputs and capital spending/investment;
- ❑ Exchequer impacts, including tax payments and payments to local authorities, and receipts from prospecting licence and mining facility holders through royalties, dead rent and licence fees; and
- ❑ Financial contributions by exploration and mining companies to local communities.

In the following section, each dimension of impact is assessed separately in the case of mining activity, exploration/prospecting and in aggregate across both mining and exploration. It is important to note from the outset that without exploration activities there would be no new discoveries or new mines, and therefore this activity is crucial for the maintenance and expansion of the economic value (including jobs supported) of the wider industry.

3.2 Output

3.2.1 Mining Sales

The output of the mining sector can be measured by reference to the value of its sales revenues. Table 3.1 below indicates the overall value of sales revenue during 2011 and 2012 across the operational mines in Ireland. Total sales revenue in the mining amounted to over €426.1 million (estimated) in 2012, down slightly from €454.6 million in 2011.

Table 3.1: Total Sales Turnover in Mining Sector		
Mining Sector	2011	2012e*
Sales Turnover - € Million	454.6	426.1
Source: Indecon Confidential Survey of Mining Licence Holders * Note: 2012 Sales are based on estimates from the survey respondents. These figures exclude any activities related to 'Brownfield' exploration.		

Export sales

The majority of sales revenue earned in the mining industry is from export sales. In 2012, a total of €401.5 million (est.), or 94% of sales revenue, was generated from export sales (see table below).

Table 3.2: Total Export Sales Turnover of the Mining Sector and Export Sales Revenue as % of Total Sales Revenue		
	2011	2012e
Export Sales Turnover - € Million	421.0	401.5
Export Sales as % of Total Sales	93%	94%
Source: Indecon Confidential Survey of Mining Licence Holders * Note: 2012 Sales are based on estimates from the survey respondents. These figures exclude any activities related to 'Brownfield' exploration.		

3.3 Employment

3.3.1 Overview of Labour Force in Mining

The table below provides an overview of key features of the labour force in the mining sector, by reference to data from the Census of Population on persons who state their occupation as 'mining of metal ores'. According to the Census figures, there were a total of 1,144 people at work among a total labour force of 1,260 in mining of metal ores in Ireland in 2011. Approximately 116 people were unemployed (including those looking for their first job). The unemployment rate in mining of metal ores in 2011 was approximately 9.2%. This is substantially lower than the prevailing average unemployment rate of 14.6% across all sectors of the economy in 2011.

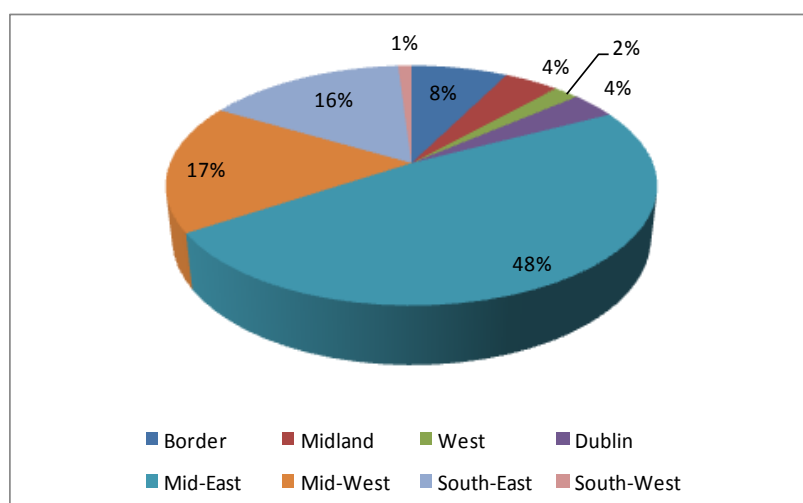
Table 3.3: Overview of Industry Labour Force in Mining-related Occupations	
	2011
Total Number in Labour Force	1,260
Number at Work	1,144
Number Unemployed (incl. looking for a first job)	116
Unemployment Rate	9.2%
Seasonally Adjusted Annual Average Standardised Unemployment Rate (State)	14.6%
Source: CSO Census of Population and CSO Live Register Data Note: Statistics based on population aged 15 and over and refer to persons engaged in mining of metal ores. These estimates only include mining of metal ores and therefore exclude employment in mining of gypsum.	

Regional distribution of employment in mining

In Table 3.4 below, the total number of people at work in mining of metal ores in 2011 is broken down by region in Ireland. One of the features of the industry is the broad regional distribution of its workforce, with significant numbers of people employed in the Mid-East, Mid-West and South-East, as well as across other regions in the West and South West.

Table 3.4: Employment in Mining by Region in Ireland	
Region	2011
Border	87
Midland	49
West	23
Dublin	41
Mid-East	553
Mid-West	200
South-East	179
State	1,144
Source: CSO, Census of Population Note: Statistics based on population aged 16 and over and refer to persons engaged in mining of metal ores. These estimates only include mining of metal ores and therefore exclude employment in mining of gypsum.	

Figure 3.1 below presents the percentage breakdown of the regional employment data above. Almost half of the workers in mining of metal ores are residing in the Mid-East of Ireland. The region with the next largest cohort of mining workers residing is the Mid-West which is closely followed by the South-East. The rural location of mining workers supports the local economies throughout the countryside through employment in the minerals sector and expenditure on local goods and services. Such wider impacts of the sector are captured in the analysis later in Section 4 of this study.

Figure 3.1: Employment in Mining by Region in Ireland

Source: Indecon analysis of data from the Census of Population 2011

Note: Statistics are based on the population aged 15 and over in the labour force and refer to persons engaged in mining of metal ores. These estimates only include mining of metal ores and therefore exclude employment in mining of gypsum.

3.3.2 Employment in Mining – Indecon’s research

Table 3.5 below shows the number of workers directly employed in mining activities in the industry in Ireland, based on data collected through Indecon’s survey of mining licence/lease holders. The total number of persons engaged in mining includes direct employment in mining and in mining-related other support activities.

Table 3.5: Direct Employment Supported in Mining						
Employment in:	2011			2012e*		
	Full Time Persons - Average	FTE of Part Time	Total FTEs	Full Time Average	FTE of Part Time	Total FTEs
Employed in Mining Activities*	816	24	840	821	11	832
Employed in Other Support Activities (estimated mining-related)**	277	12	289	278	24	302
Total Persons Engaged	1,093	36	1,129	1,099	35	1,134

Source: Indecon Confidential Survey of Mining Licence Holders

Notes: * 2012 employment is based on estimates from mining companies responding to Indecon’s survey.
 ** Other support activities include activities such as office employment and administration, technical and research activities.

Indecon's research indicates that there were 1,093 full-time persons and 36 full-time equivalent of part-time persons directly employed in mining activities, implying a total of 1,129 full-time equivalent jobs directly supported by mining in 2011. In 2012, the number of full-time persons employed in mining increased slightly while the number of full-time equivalent part-time employees fell slightly. Overall, a total of 1,134 full-time equivalent jobs were supported directly by mining in Ireland in 2012. Among all persons engaged in mining approximately one quarter of them were mining support staff in 2011 and 2012.

As part of Indecon's survey of mining licence holders, each of the respondents was also asked to indicate the proportion of their mining staff which are skilled and unskilled and also the proportion who are graduates/postgraduates and those who are non-graduates. Table 3.6 presents the skills and education profile of mining workers in Ireland at industry level. Among all workers employed in mining in 2012, 81% of were classified as skilled workers by the mining licence holders and the remaining 19% were considered unskilled workers. Approximately 18% of mining workers in Ireland in 2012 were graduates/postgraduates and the remaining 82% were non-graduates.

Table 3.6: Skills Profile of Employment in the Mining Sector – 2012

Mining Sector	Skilled	Unskilled	Graduate / Postgraduate	Non-Graduate
Proportion of all Persons Engaged in Mining	81%	19%	18%	82%
Source: Indecon Confidential Survey of Mining Licence Holders Note: Estimates based on a weighted average of Survey Responses.				

3.3.3 Employment in Exploration

Employment in exploration has expanded alongside the increased expenditure that has taken place in recent years (see further later in this section). In 2011, a total of 225 jobs were supported by exploration activities in the sector and this increased to 240 full-time equivalent persons (est.) in 2012 (see table overleaf).

Table 3.7: Direct Employment Supported in Exploration

Employment in:	2011			2012e*		
	Full Time Persons - Average	FTE of Part Time	Total FTEs	Full Time Persons - Average	FTE of Part Time	Total FTEs
Employment in Exploration (in Mines/'brownfield')	12.9	0.0	12.9	15.0	0.0	15.0
Employment in Exploration (Prospecting Licence Areas)	145.0	8.1	153.1	144.0	14.5	158.5
Employment in Other Support Services (estimated exploration-related)	55.8	3.5	59.3	57.4	8.9	66.2
Total Persons Engaged	214	12	225	216	23	240
Source: Indecon Confidential Survey of Prospecting Licence Holders and Indecon analysis *Note: Figures are based on the grossing up of sample data from the Indecon Confidential Survey of Prospecting Licence Holders. Total persons engaged have been rounded up to the nearest number of persons. Employment in exploration includes both 'Brownfield' exploration and 'Greenfield' exploration.						

Prospecting licence holders responding to Indecon's survey were also asked to indicate the proportion of their staff who were considered skilled and those who were graduates/postgraduates. Among the exploration workers, 77% were skilled in 2012 which is a slightly lower proportion than the mining workers. The remaining 23% of exploration staff were unskilled. Over 40% of the prospecting/exploration workers in 2012 were graduates or postgraduates. This finding is consistent with the significant rise in prospecting/exploration activity in recent years employing graduates from technical backgrounds such as geologists, geophysicists, engineers, surveyors as well as semi-skilled field workers. Employing graduates in the mining and mineral exploration sector ensures that they remain in Ireland which is essential for the preservation of our highly skilled labour force and in turn, the fact that the majority of prospecting workers are Irish residents means that incomes are spent in domestic economy.

Table 3.8: Skills Profile of Employment in Exploration – 2012

	Skilled	Unskilled	Graduate / Postgraduate	Non-Graduate
Proportion of all Persons Engaged in Prospecting/Exploration	77%	23%	42%	58%
Source: Indecon Confidential Survey of Prospecting Licence Holders Note: Estimates based on a weighted average of Survey Responses.				

3.3.4 Direct Employment in Mining and Exploration

Table 3.9 integrates the above elements to present a summary of the overall number of persons employed directly in both mining and exploration. In 2011 there were a total of 1,354 full-time equivalent jobs supported through mining and prospecting activities and this expanded to an estimated total of 1,373 FTE jobs in 2012.

Table 3.9: Direct Employment Supported in Mining and Exploration						
Employment in:	2011			2012e		
	Full Time Persons - Average	FTE of Part Time	Total FTEs	Full Time Persons - Average	FTE of Part Time	Total FTEs
Employed in Mining Activities	816.0	24.0	840.0	821.0	11.0	832.0
Employed in Exploration (Mines)	12.9	0.0	12.9	15.0	0.0	15.0
Employed in Exploration (Prospecting Licence Area)	145.0	8.1	153.1	144.0	14.5	158.5
Employed in Other Support	332.9	15.5	348.4	335.0	32.9	367.8
Grand Total Persons Engaged	1,307	48	1,354	1,315	58	1,373
Source: Indecon analysis based on Confidential Surveys of Mining Licence Holders and Prospecting Licence Holders Note: Grand Total Persons Engaged is rounded up to the nearest person. These totals include employment in mining, employment 'Brownfield' exploration and employment in 'Greenfield' exploration.						

3.4 Expenditures

The overall economic impact of mineral exploration and mining activities will be a function of the level of expenditures of mining and prospecting licence holders on goods and services inputs. This will include impacts through spending on wages and salaries of persons employed, in addition to expenditures on non-labour business inputs and capital investment. These components are described below.

3.4.1 Wages and Salaries

Mining

A total of almost €103 million (est.) was spent on wages and salaries by mining companies during 2012, up slightly from approximately €96.6 million in 2011 (see table below).

Table 3.10: Total Direct Expenditure on Wages & Salaries in Mining		
	2011	2012e
Wages and Salaries – Mining - €	96,587,739	102,954,737
Source: Indecon Confidential Survey of Mining Licence Holders. Note: Total expenditure on wages and salaries in mining excludes expenditure on salaries in 'Brownfield' exploration.		

Exploration

The table below presents our estimates of expenditure on wages and salaries in the exploration sector in 2011 and 2012 related to exploration activities only. This expenditure represents a component of the total exploration expenditure on Irish-produced goods and services. In 2011, total wages and salaries in prospecting was in excess of €4.4 million and was almost €4.3 million (est.) in 2012.

Table 3.11: Wages and Salaries in Exploration Activities		
	2011	2012e
Wages and Salaries – Exploration - €	4,438,749	4,290,387
Source: Indecon analysis of survey of prospecting licence holders and Indecon analysis of DCENR data on exploration expenditure Note: Wages and Salaries in exploration include both 'Brownfield' exploration and "Greenfield exploration.		

Exploration and Mining

Table 3.12 presents total direct expenditure on wages and salaries earned by workers in both exploration and mining. Total wages and salaries increased from €101 million to €107.2 million.

Table 3.12: Total Direct Expenditure on Wages and Salaries in Mining and Exploration		
	2011	2012e
Total Wages and Salaries – Mining and Exploration - €	101,026,488	107,245,124
Source: Indecon analysis based on Confidential Surveys of Mining Licence Holders and Prospecting Licence Holders		

3.4.2 Expenditure on Irish-produced Non-labour Inputs

Mining

When considering the overall economic impact of the mining sector on the domestic Irish economy a crucial component is that of expenditure on Irish produced goods and services.

The level of expenditure on Irish goods and services varies on an annual basis and can be influenced by temporary arrangements such as purchase of ore from other mines and specific large expenditures on construction activities in particular years. There are, however, very high levels of Irish spend on Irish produced goods and services including electricity, cement and related products, in addition to a wide range of expenditures on Irish services. This includes expenditures on rail services, water services, medical, legal and financial and security services. In addition there are also in particular years high levels of expenditure on construction services carried out by Irish contractors. Our analysis indicates that in 2012 expenditures on Irish produced non-labour goods and services business inputs within mining companies amounted to €131.8 million. However, this included some temporary items of expenditure which may not be typical. We therefore believe that it would be more prudent to use a lower figure of around €112 million per annum as the Irish non-labour spend contribution of the mining sector. This also includes spend on areas such as

consultants, accountants and Irish drilling sub-contractors and Irish geochemical laboratory analysis.

Expenditures on professional and other services are subject to significant year-to-year variation depending on activities. In 2011 and 2012, these significant amounts of expenditure on Irish produced non-labour inputs in mining can be directly attributed to supporting the demand for Irish goods and services.

Exploration

Exploration expenditure on Irish-produced non-labour inputs is estimated to have amounted to €23.7 million in 2012. This comprised €12.5 million on purchases from sub-suppliers, finished goods and raw materials and €11.17 million on professional services and other services. A similar level of expenditure was evident in 2011.

3.4.3 Capital Expenditure / Investment

Mining

The total amount spent by the main operating mines in Ireland on capital goods in 2011 and 2012 is shown in Table 3.13 below. It is estimated that a total of €41.8 million was invested in capital goods among the four operating mines in Ireland during 2012. In addition, there are some small capital expenditures relating to the exploration activities.

Table 3.13: Capital Expenditure associated with Mining Activities		
	2011	2012e
Total Capital Expenditure - €	50,932,386	41,756,326
Source: Indecon Confidential Survey of Mining Licence Holders <i>Note: Expenditure does not include 'Brownfield' exploration.</i>		

3.4.4 Total Expenditure

Mining

Table 3.14 overleaf combines all the expenditure components profiled above for the mining sector, indicating a total for mining expenditure of €288.2 million and €276.5 million in 2011 and 2012, respectively. This includes expenditure on Irish-produced non-labour inputs amounting to €140.7 million in 2011 and an estimated €131.8 million in 2012. However, as noted above, the figure for 2012 includes some temporary items of expenditure which are not typical of on-going annual expenditures on business inputs within the mining companies, and a figure of approximately €112 million per annum would be more representative of the non-labour spend contribution of the mining sector.

Table 3.14: Total Direct Expenditure in Mining

	2011	2012e	Average % Share
Total Expenditure on Irish-produced Non-Labour Inputs - €	140,733,537	131,825,980	48.3%
Total Direct Expenditure on Wages & Salaries - €	96,587,739	102,954,737	35.3%
Total Direct Capital Expenditure - €	50,932,386	41,756,326	16.4%
Total Direct Mining Expenditure - €	288,253,662	276,537,043	100%

Source: Indecon Confidential Survey of Mining Licence Holders.

Note: This expenditure relates to expenditure in mining only and excludes 'Brownfield' exploration.

Exploration

Total exploration expenditure as reported by the Department of Communications, Energy and Natural Resources in 2011 was more than 250% of what it was in 2007. This represents a significant increase in exploration activity ("greenfield" and "brownfield") and the number of prospecting licences granted. This increase in expenditure over the period prevailed despite a significant drop in 2009.

Table 3.15: Recent Trend in Total Exploration Expenditure

	2007	2008	2009	2010	2011	2012e**
Total Exploration Expenditure - €*	14,470,000	20,200,000	11,700,000	28,800,000	38,315,574	36,682,880

Source: Data from Department of Communications, Energy and Natural Resources Annual Report 2011

* Includes 'greenfield' exploration and 'brownfield' exploration in mining areas.

**Indecon estimate of total exploration expenditure 2012 based on the change in exploration expenditure from 2011 to 2012 among survey respondents.

Exploration and Mining

Table 3.16 combines the total amount of expenditure in mining and exploration activities which includes exploration expenditure, expenditure on wages and salaries and expenditure on capital goods (including imported goods). In 2011 this amounted to almost €326.6 million and in 2012 total sectoral expenditure was approximately €313.2 million.

Table 3.16: Total Direct Expenditure in Mining and Exploration

	2011	2012e
Total Direct Expenditure in Mining and Exploration* - €	326,569,236	313,219,923

Source: Indecon analysis of survey of prospecting licence holders and Indecon analysis of DCENR data on exploration expenditure

* Includes expenditure on imported goods & services (e) = estimate

3.5 Gross Value Added Contribution

Gross Value Added (GVA) is defined as the value of production less the value of intermediate consumption. It is an equivalent measure to that of gross Domestic Product (GDP), which measures the extent of value-added across the economy as a whole. GVA is therefore the best measure of the contribution of a sector/industry to economy-wide GDP.

In the case of the mining activity in Ireland, we estimate the GVA contribution by reference to the value of sales turnover less expenditures on intermediate inputs (i.e., non-labour inputs such as purchases of raw materials and bought-in drilling and other services).

Presented in Table 3.17 below are Indecon's estimates of GVA of the mining sector, utilising data provided to Indecon by the four operating mines in Ireland. We estimate that mining activity resulted in a significant GVA contribution of €294.3 million during 2012.⁴

Table 3.17: Gross Value Added of Mining to the Irish Economy 2012	
	2012e - €
Value of Gross Sales Turnover	426,115,000
Gross Value Added - Mining	294,289,020
<i>GVA as % of Turnover</i>	69.1%
<i>GVA per Employee</i>	259,514
Source: Indecon Confidential Survey of Mining Licence Holders.	

3.6 Exchequer Contribution

In addition to its impact through expenditures, GVA and direct employment supported, the mineral exploration and mining sector also contributes to the State in the form of various payments to the Exchequer. These include:

- ☐ Tax payments, including PAYE, PRSI, USC, VAT and Corporation Tax;
- ☐ Payments to local authorities (commercial rates etc.); and
- ☐ Payments of royalties, rents and licence fees.

These elements are assessed below in respect of mining, exploration, and both of these sub-sectors taken together.

3.6.1 Mining

The total exchequer contribution among the mining licence holders currently operating mines in Ireland comprises income and other tax payments, and payments to local authorities. It is estimated that mining licence/lease holding companies contributed a total of €54.3 million in taxes and local authority payments during 2012 (see table overleaf).

⁴ This measure is not applicable to exploration activities as prospecting licence holders do not generate product sales. This measure also excludes persons employed in 'brownfield' exploration activity taking place in existing mines.

Table 3.18: Total Direct Exchequer Contributions of Mining 2011 & 2012		
	2011	2012e
Total Tax Payments €	62,434,776	51,573,635
Total Payment to Local Authorities €	2,781,886	2,773,069
Total Direct Contribution €	65,216,662	54,346,704
Source: Indecon Confidential Survey of Mining Licence Holders		

3.6.2 Exploration

Table 3.19 shows the total exchequer contribution of prospecting licence holders which are carrying out exploration in prospecting licence areas and State Mining Facilities. It is estimated that prospecting licence holders paid a total of €2.24 million in taxes and other exchequer contributions during 2012.

Table 3.19: Exchequer Contributions in Exploration		
	2011	2012e
Estimated Total Tax Payments - €	2,315,314	2,139,484
Estimated Total Payments to Local Authorities - €	213,057	107,552
Estimated Total Exchequer Contributions in Exploration - €	2,528,371	2,247,036
Source: Indecon analysis of survey of prospecting licence holders and Indecon analysis of DCENR data on exploration expenditure		

3.6.3 Mining and Exploration

The total combined direct exchequer contribution of mining and exploration in the mining sector for 2011 and 2012 is shown in the table overleaf. It is estimated that the sector contributed a total of €56.6 million in tax and local authority payments during 2012.

Table 3.20: Total Direct Exchequer Contribution of Mining and Exploration 2011 & 2012

	2011	2012e
Tax Payments - €	64,750,090	53,713,119
Payments to Local Authorities - €	2,994,943	2,880,621
Exchequer Contribution - €	67,745,033	56,593,740
Source: Indecon analysis of survey of prospecting licence holders and Indecon analysis of DCENR data on exploration expenditure		

3.6.4 Receipts from mining licence/lease holders

The receipts of the Department of Communications, Energy and Natural Resources from mining licence/lease holders in the form of royalties, licence fees and other payments over the period from 2008 to 2012 are shown in the table below. Revenue earned from collection of these payments has increased substantially in recent years and totalled over €8.6 million in 2012.

Table 3.21: State Receipts from Mining Licence/Lease Holders

	2008	2009	2010	2011	2012
Mining Receipts (Dead Rent and Royalties)	€6,169,742	€3,690,229	€6,911,648	€9,681,192	€8,606,914
Source: Data from Department of Communications, Energy and Natural Resources, Annual Report 2011.					

3.6.5 Receipts from prospecting licence holders

Details of receipts of the Department of Communications, Energy and Natural Resources in respect of prospecting licence fees are shown in the table below. Total receipts from licence fees reached €356,595 in 2012. It should also be noted that holding a prospecting licence in Ireland carries with it the condition that the exploration company commits to a minimum level of expenditure for the licence within a biannual period.

Table 3.22: State Receipts from Prospecting Licence Holders

	2008	2009	2010	2011	2012
Exploration Receipts (Prospecting Licence Fees)	€334,466	€200,765	€300,875	€338,540	€356,595
Source: Data from Department of Communications, Energy and Natural Resources, Annual Report 2011.					

3.6.6 Mining and Exploration

The table below integrates the above elements to identify the overall level of receipts from royalties, licence fees and other payments by mining and prospecting licence holders. A total of just under €9 million was paid to the State during 2012.

Table 3.23: Overall State Receipts from Mining Licence/Lease and Prospecting Licence Holders					
	2008	2009	2010	2011	2012
Total Receipts from Mining and Prospecting Licence Holders	€6,504,208	€3,890,994	€7,212,523	€10,019,732	€8,963,509
<i>Source: Data from Department of Communications, Energy and Natural Resources, Annual Report 2011, and report by the Minister for Communications, Energy and Natural Resources for the 6 months ended 31st December 2012.</i>					

3.7 Contributions to Local Communities

In addition to creating and supporting jobs and expenditures at local level in Ireland, mining and exploration companies also contribute to local communities in the form of financial supports to community sporting and other organisations. According to the findings of Indecon's research, mining and prospecting companies contributed a total of almost €460,000 to local community activities and organisations during 2012, up from over €360,000 in 2011 (see table below).

Table 3.24: Total Financial Contributions to Local Communities by Mining and Exploration Companies		
	2011	2012e
Financial Contributions to Local Communities – Mining and Exploration Companies - €	360,858	458,885
<i>Source: Indecon analysis of survey of prospecting licence holders and Indecon analysis of DCENR data on exploration expenditure.</i>		

3.8 Summary of Findings

This section assessed the direct economic impacts of the mineral exploration and mining sector in Ireland. The key findings were as follows:

- ❑ Output in mining, as measured by sales turnover, amounted to €426.1 million in 2012;
- ❑ Total direct expenditure on wages and salaries for workers in mining and exploration amounted to €107.2 million in 2012;
- ❑ Total expenditures on Irish-produced goods and services for 2011 was approximately €120 million;
- ❑ Total direct expenditure in mining and exploration amounted to €313.2 million in 2012; The overall Gross Value Added contribution of the mining sector to the Irish economy is estimated at €294.3 million in 2012;
- ❑ An estimated 1,373 full-time equivalent persons were employed directly in mining and exploration activities during 2012;
- ❑ Exploration and mining companies contributed a total of €56.6 million in tax and other payments to the Exchequer and to local authorities during 2012;
- ❑ The State also benefits from payments made by prospecting licence and mining facility holders in the form of royalties, licence fees and other payments. These receipts amounted to just under €9 million during 2012; and
- ❑ In addition to creating and supporting jobs and expenditures at local level in Ireland, mining and exploration companies also contribute to local communities in the form of financial supports to community sporting and other organisations. According to the findings of Indecon's research, mining and prospecting companies contributed a total of almost €460,000 to local community activities and organisations during 2012.

4 Assessment of Indirect and Economy-wide Impacts

4.1 Introduction

This section considers the important issue of the larger, economy-wide impacts arising from the direct economic impacts of mining in the preceding section. For both mining and exploration we focus on the wider output, employment and income impacts. These impacts are combined to provide an overview of the total economic impact of the sector.

4.2 Approach to Measurement

The approach applied in arriving at the economy-wide impacts is based on the application of input-output analysis, which forms the basis for derivation of the national accounts for the Irish economy in line with internationally agreed principles. Specifically, this section utilises the supply and use and input-output tables for the Irish economy developed by the CSO.⁵ The analysis is undertaken through the development and application of *multipliers* for employment which are derived from these tables.

In general, there are two types of multiplier which are relevant in the context of assessing economic impact, namely:

- ❑ Type I multipliers; and
- ❑ Type II multipliers.

Type I multipliers enable the estimation of the economy-wide impacts arising from the *direct plus indirect impacts* associated with changes in activity that occur in backward-linked industries due to an increase in demand from the directly affected industry.

Type II multipliers are an expansion of the Type I construct but include *direct, indirect and induced impacts*. Induced impacts arise through the additional consumption that takes place as a result of the additional employment incomes created through the indirect impacts. In other words, Type II multipliers include the household as an additional sector in the economic relationships that make up the input-output framework.

Both Type I and Type II multipliers can be developed and applied in the case of employment.⁶

The CSO's supply and use and input-output tables for the Irish economy include output multipliers based on the published Leontief inverse matrix. The published tables do not include Type I employment multiplier or Type II multipliers. For the purposes of this study, Indecon has developed a framework of Type II output multipliers which permit the estimation of economy-wide impacts arising from the operations of mining companies. These multipliers have been developed based on an expansion of the existing CSO framework to include interactions with the household sector.⁷

⁵ CSO (2005), Op. Cit.

⁶ The Type I and Type II multipliers applied in this study relate to a combination of the 'Coal, peat, petroleum and metal ore extraction' and 'Other mining and quarrying' sectors in the CSO Input-Output Tables for the Irish Economy.

⁷ The derivation of Type II multipliers requires the re-calculation, through matrix operations, of the Leontief Inverse matrix to include the household sector.

4.3 Expenditure Impacts

Table 4.1 below shows the results from our modelling of the economic impacts associated with the expenditures undertaken by mining companies. As indicated in Section 3, total expenditure in mining is estimated to have amounted to €276.5 million in 2012. We estimate the indirect impact of this expenditure to amount to approximately €251.6 million. This measure relates to industries supplying inputs to the mining industry, which experience an increase in activity due to the knock-on effects of increased demand from the mining industry. The induced output impact of mining expenditure relates to the additional consumption that takes place as a result of the additional employment incomes created through the indirect impacts of mining expenditure. This induced impact amounted to an estimated €186.7 million in 2012. The combined overall economy-wide impact resulting from the direct, indirect and induced impacts is estimated at €714.9 million in 2012. The combined overall economy-wide output impact in 2011 amounted to almost €745.2 million.

Table 4.1: Modelling of Economic Impacts of Mining Sector – Economy-wide Impacts of Mining Expenditures		
	2011	2012e
<i>Direct Impact</i>		
Total Mining Expenditure - € (A)	288,253,662	276,537,043
<i>Indirect Multiplier Impact</i>		
Sector Output Multiplier - Type I (B)	1.91	1.91
Indirect Output Impact - € (C = (A * B) - A)	262,307,403	251,645,419
<i>Induced Multiplier Impact</i>		
Sector Output Multiplier - Type II (D)	2.59	2.59
Induced Output Impact - € (E = (A * D) - C)	194,600,038	186,690,149
<i>Overall Output Impact</i>		
Direct + Indirect + Induced Output Impact - €	745,161,103	714,872,611
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i> <i>Note: The economic impact of mining expenditures excludes expenditure in 'Brownfield' exploration.</i>		

The indirect, induced and economy-wide output impacts of total exploration expenditure among prospecting licence holders is shown in Table 4.2. In 2012 the economy-wide (direct, indirect and induced) impact of exploration expenditure reached a significant total of almost €95 million. The indirect component of this amounted to €33.3 million while the induced impact was €24.7 million. In 2011 the total direct, indirect and induced impact of exploration expenditure was over €99 million.

Table 4.2: Modelling of Economic Impacts of Exploration – Economy-wide Impacts of Exploration Expenditures		
	2011	2012e
<i>Direct Impact</i>		
Total Direct Exploration Expenditure - € (A)	38,315,574	36,682,880
<i>Indirect Multiplier Impact</i>		
Sector Output Multiplier - Type I (B)	1.91	1.91
Indirect Output Impact - € ($C = (A * B) - A$)	34,866,717	33,380,984
<i>Induced Multiplier Impact</i>		
Sector Output Multiplier - Type II (D)	2.59	2.59
Induced Output Impact - € ($E = (A * D) - C$)	25,866,843	24,764,611
<i>Overall Output Impact</i>		
Direct + Indirect + Induced Output Impact - €	99,049,133	94,828,474
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i> <i>Note: The economy-wide impacts of exploration expenditure relate to expenditure in 'Brownfield' exploration and 'Greenfield' exploration.</i>		

Analysis of the combined economy-wide output impact of expenditure in mining and exploration is presented in Table 4.3. The combined economy-wide output impact of expenditure in mining is estimated to be €844.2 million in 2011 and €809.7 million in 2012.

Table 4.3: Modelling of Economic Impacts of Mining and Exploration – Economy-wide Impacts of Mining and Exploration Expenditures

	2011	2012e
<i>Direct Impact</i>		
Total Direct Exploration and Mining Expenditure - € (A)	326,569,236	313,219,923
<i>Indirect Multiplier Impact</i>		
Sector Output Multiplier - Type I (B)	1.91	1.91
Indirect Output Impact - € (C = (A * B) - A)	297,174,120	285,026,403
<i>Induced Multiplier Impact</i>		
Sector Output Multiplier - Type II (D)	2.59	2.59
Induced Output Impact - € (E = (A * D) - C)	220,466,881	211,454,760
<i>Overall Output Impact</i>		
Direct + Indirect + Induced Output Impact - €	844,210,237	809,701,086
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i>		

4.4 Employment Impacts

Given the levels of unemployment in Ireland, the wider employment impacts of the mining sector are of particular importance in this study. An inter-sectoral indirect employment multiplier of 1.92 and an induced multiplier of 2.41 have been selected for this analysis of the impacts of employment.

The results from our analysis of the multiplier economic impacts of employment in mining in 2011 and 2012 are presented in Table 4.4. The total number of FTE's employed in mining in 2011 amounted to 1,129 jobs and the indirect employment impact of this on sectors linked to mining was 1,042. The further induced employment impacts of the employment income earned as a result of the indirect employment impact relates to approximately 546 jobs. Finally, the overall economy-wide employment impact of mining in 2011 amounted to a significant 2,718 FTE jobs. In 2012 the economy-wide impacts is estimated to be 2,729 and the breakdown of this analysis is shown in Table 4.4.

Table 4.4: Modelling of Economic Impacts of Mining Sector – Economy-wide Employment Impacts		
	2011	2012e
<i>Direct Impact</i>		
Number of Full-Time Equivalent (FTE) Persons Employed in Mining (A)	1,129	1,134
<i>Indirect Multiplier Impact</i>		
Sector Employment Multiplier - Type I (B)	1.92	1.92
Indirect Employment Impact - FTEs ($C = (A * B) - A$)	1,042	1,047
<i>Induced Multiplier Impact</i>		
Sector Employment Multiplier - Type II (D)	2.41	2.41
Induced Employment Impact - FTEs ($E = (A * D) - C$)	546	548
<i>Overall Employment Impact</i>		
Direct + Indirect + Induced Employment Impact - FTEs	2,718	2,729
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i> <i>Note: The economic impact of mining employment excludes employment in 'Brownfield' exploration.</i>		

Analysis of the direct, indirect and induced impacts of employment supported in exploration is presented in the table overleaf. It is estimated that a total of 542 jobs were supported directly and indirectly through the exploration activities among prospecting licence holders in 2011 and this increased to 577 in 2012.

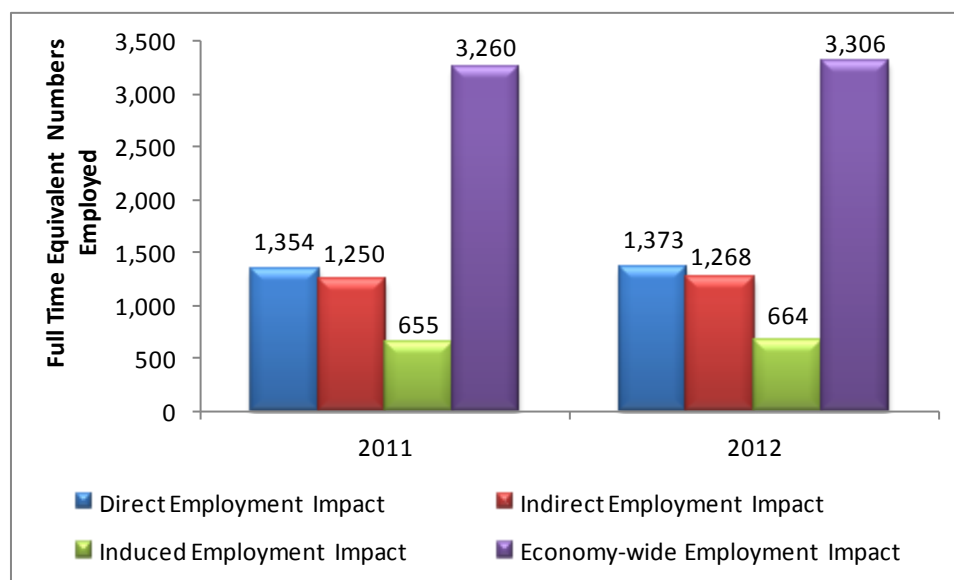
Table 4.5: Modelling of Economic Impacts of Exploration – Economy-wide Employment Impacts		
	2011	2012e
<i>Direct Impact</i>		
Number of Full-Time Equivalent (FTE) Persons Employed in Exploration (A)	225	240
<i>Indirect Multiplier Impact</i>		
Sector Employment Multiplier - Type I (B)	1.92	1.92
Indirect Employment Impact - FTEs ($C = (A * B) - A$)	208	221
<i>Induced Multiplier Impact</i>		
Sector Employment Multiplier - Type II (D)	2.41	2.41
Induced Employment Impact - FTEs ($E = (A * D) - C$)	109	116
<i>Overall Employment Impact</i>		
Direct + Indirect + Induced Employment Impact - FTEs	542	577
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i> <i>Note: The economic impact of exploration employment excludes employment in 'Brownfield' exploration and 'Greenfield' exploration.</i>		

The total economy-wide impact of jobs supported directly and indirectly through employment in mining and exploration activities amounted to a total of 3,306 full-time equivalent jobs in 2012 which was an increase on the impact in 2011 which amounted to 3,260 (see table overleaf).

Table 4.6: Modelling of Economic Impacts of Mining and Exploration – Economy-wide Employment Impacts		
	2011	2012e
<i>Direct Impact</i>		
Number of Full-Time Equivalent (FTE) Persons Employed in Exploration and Mining (A)	1,354	1,373
<i>Indirect Multiplier Impact</i>		
Sector Employment Multiplier - Type I (B)	1.92	1.92
Indirect Employment Impact - FTEs ($C = (A * B) - A$)	1,250	1,268
<i>Induced Multiplier Impact</i>		
Sector Employment Multiplier - Type II (D)	2.41	2.41
Induced Employment Impact - FTEs ($E = (A * D) - C$)	655	664
<i>Overall Employment Impact</i>		
Direct + Indirect + Induced Employment Impact - FTEs	3,260	3,306
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i>		

Figure 4.1 provides a graphical presentation of the direct, indirect and induced components of the economy-wide impacts of employment in mining from the analysis above. Direct employment as a result of mining and exploration activities has far-reaching employment impacts across the economy.

Figure 4.1: Components of Economy-wide Employment Impacts – Mining and Exploration



Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.

4.5 Income Impacts

The final component of our analysis of the economic multiplier impacts of mining relates to the income multiplier impacts arising from the wages and salaries earned by those employed in mining. The inter-sectoral indirect and induced multipliers applied in our analysis of this component are 2.71 and 3.18, respectively.

The indirect impact of wages and salaries earned in mining in 2011 are close to €164.77 million and adding the income impact of €45.36 million to this, we estimate that the overall economy-wide income multiplier impact of wages and salaries in mining is in excess of €306.7 million. In 2012 the overall direct, indirect and induced impacts of wages and salaries earned in mining expanded to close to €327 million in 2012. The components of this overall impact are shown in Table 4.7.

Table 4.7: Modelling of Economic Impacts of Mining Sector – Income Multiplier Impacts		
	2011	2012e
<i>Direct Impact</i>		
Expenditure on Wages & Salaries in Mining - € (A)	96,587,739	102,954,737
<i>Indirect Multiplier Impact</i>		
Sector Income Multiplier - Type I (B)	2.71	2.71
Indirect Income Impact - € (C = (A * B) - A)	164,768,088	175,629,488
<i>Induced Multiplier Impact</i>		
Sector Income Multiplier - Type II (D)	3.18	3.18
Induced Income Impact - € (E = (A * D) - C)	45,359,220	48,349,268
<i>Overall Income Impact</i>		
Direct + Indirect + Induced Income Impact - €	306,715,046	326,933,493
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i> <i>Note: The income multiplier impact of mining does not include 'Brownfield' exploration.</i>		

In relation to exploration activities among the prospecting licence holders the indirect, induced and economy-wide income impacts of wages and salaries earned by staff are estimated in Table 4.8. The combined direct, indirect and induced income impacts arising from the wages and salaries paid to staff directly supported by exploration activities was estimated at €13.6 million in 2012.

Table 4.8: Modelling of Economic Impacts of Exploration – Income Multiplier Impacts		
	2011	2012e
<i>Direct Impact</i>		
Expenditure on Wages & Salaries in Exploration - € (A)	4,438,749	4,290,387
<i>Indirect Multiplier Impact</i>		
Sector Income Multiplier - Type I (B)	2.71	2.71
Indirect Income Impact - € (C = (A * B) - A)	7,572,020	7,318,930
<i>Induced Multiplier Impact</i>		
Sector Income Multiplier - Type II (D)	3.18	3.18
Induced Income Impact - € (E = (A * D) - C)	2,084,511	2,014,838
<i>Overall Income Impact</i>		
Direct + Indirect + Induced Income Impact - €	14,095,280	13,624,155
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i> <i>Note: The income multiplier impact of exploration includes "Brownfield" and 'Greenfield' exploration.</i>		

The combined economy income impact of wages and salaries earned by employees directly supported by mining or exploration is presented in Table 4.9. This represents an estimate of the economy-wide income impact of wages and salaries paid across the mining and minerals exploration sector. In 2012 this impact amounted to over €340.5 million.

Table 4.9: Modelling of Economic Impacts of Mining and Exploration – Income Multiplier Impacts		
	2011	2012e
<i>Direct Impact</i>		
Expenditure on Wages & Salaries in Mining and Exploration - € (A)	101,026,488	107,245,124
<i>Indirect Multiplier Impact</i>		
Sector Income Multiplier - Type I (B)	2.71	2.71
Indirect Income Impact - € ($C = (A * B) - A$)	172,340,107	182,948,418
<i>Induced Multiplier Impact</i>		
Sector Income Multiplier - Type II (D)	3.18	3.18
Induced Income Impact - € ($E = (A * D) - C$)	47,443,731	50,364,106
<i>Overall Income Impact</i>		
Direct + Indirect + Induced Income Impact - €	320,810,326	340,557,648
<i>Source: Indecon analysis of surveys of mining and prospecting licence holders and data from Department of Communications, Energy and Natural Resources (EMD) Annual Report 2011 and Indecon model of Irish economy.</i>		

4.6 Summary of Findings

This section assessed the wider, economy-wide impacts arising from the direct economic impacts of mining in the preceding section. The main findings were as follows:

- ❑ The direct, indirect and induced impact of total expenditure in the mining and mineral exploration sector in 2012 exceeded €809.7 million which was a reduction on the total impact of €844.2 million in 2011;
- ❑ The overall employment impact (direct, indirect and induced) for mining and exploration in 2011 reached an estimated 3,260 full-time equivalent jobs and in 2012 this significant impact expanded further to a total estimate of 3,306 full-time equivalents;
- ❑ The employment alone is of particular importance within the present context of high unemployment across many sectors of the Irish economy; and
- ❑ Finally, the economy-wide income impact of wages and salaries earned in all jobs directly supported in mining and exploration activities reached an estimated €340.5 million in 2012.

5 Conclusions

This section brings together the overall findings from the preceding sections of this study including the trends in mining and exploration and the direct, indirect and induced output, employment and income impacts of activity in mining and exploration. In addition, the prospects for the mineral exploration and mining sector in Ireland are considered.

5.1 Summary of Findings from Assessment

Table 5.1 presents an overall summary of the main components of the overall economic impact of the mineral exploration and mining sector in Ireland, showing the direct as well as economy-wide impacts.

Table 5.1: Summary of Components of Economic Impacts of Mineral Exploration and Mining Sector in Ireland	
	Estimates for 2012
Employment Supported (Mining and Exploration)	
Direct Employment – Full-Time Equivalent Persons (FTEs)	1,373
Indirect and Induced Employment Supported (FTEs)	1,933
Economy-wide Employment Supported (FTEs*)	3,306
Sales Turnover (Mining)	
Value of Sales Turnover - € Million	€426.1
Expenditures (Mining and Exploration)	
Direct Expenditure on Wages and Salaries - € Million	€107.3
Total Mining and Exploration Expenditure - € Million	€313.2
Economy-wide Expenditure Impact - € Million*	€809.7
Gross Value Added (Mining)	
Gross Value Added - Mining - € Million	€274.2
Exchequer, Local Authorities and Local Communities (Mining and Exploration)	
Exchequer Contributions (including Local Authority rates etc.) - € Million	€56.6
Other Income to the State (Royalties, Licence Fees, etc.) - € Million	€9.0
Financial Contributions to Local Communities - € Million	€0.459
Source: Indecon analysis	
* Economy-wide impacts represent the indirect and induced multiplier impacts arising from the estimated direct impacts.	

The key areas of impact of the sector across the economy are employment, revenue, expenditure, gross value added and contribution to Exchequer and community. The following are the key findings from the modelling of the economic contribution of mining and exploration activities in the mining and mineral exploration industry:

- ❑ Output in mining, as measured by sales revenue, amounted to €426.1 million in 2012;
- ❑ The activities of mining and exploration companies supported 1,373 full-time equivalent persons during 2012, while an additional 1,933 FTEs were supported indirectly as a result of multiplier impacts throughout the economy;
- ❑ One of the features of the industry is the broad regional distribution of its workforce, with significant numbers of people employed in the Mid-East, Mid-West and South-East, as well as across other regions in the West and South-West;
- ❑ Total direct expenditure on wages and salaries for workers in mining and exploration amounted to €107.3 million in 2012. These expenditures also result in multiplier impacts throughout the economy, bringing the overall income impacts to an estimated €341 million in 2012;
- ❑ Total expenditures by mining and exploration companies amounted to an estimated €313.8 million during 2012. The combined direct, indirect and induced impacts of these expenditures is estimated at €809.7 million;
- ❑ The overall Gross Value Added contribution of the mining sector to the Irish economy is estimated at €274.2 million in 2012;
- ❑ Exploration and mining companies contributed a total of €56.6 million in tax and other payments to the Exchequer and to local authorities during 2012. In addition, the State benefits from payments made by prospecting licence and mining facility holders in the form of royalties, licence fees and other payments. These receipts amounted to €10.6 million in 2011 and €9 million during 2012; and
- ❑ In addition to creating and supporting jobs and expenditures at local level in Ireland, mining and exploration companies also contribute to local communities in the form of financial supports to community sporting and other organisations. According to the findings of Indecon's research, mining and prospecting companies contributed a total of almost €460,000 to local community activities and organisations during 2012.

5.2 Views on the Future Outlook of the Mining Industry

In addition to the above aspects, as part of Indecon's research on the economic contribution of the mining and minerals exploration sector, the views of mining facility and prospecting licence holders were sought in relation to the future outlook for the industry as a whole. The findings from this research are summarised in Table 5.2.

Table 5.2: Views of Mining Facility Holders and Prospecting Licence Holders on Future Outlook of Mining and Exploration Industry						
	Industry Static	Industry Decline Marginally (5%-15%)	Industry Decline Significantly (15%-40%)	Industry Expand Marginally (5-15%)	Industry Expand Significantly (15%-40%)	Other
% of Respondents Indicating this View	21%	14%	7%	43%	14%	0%
<i>Source: Indecon analysis of Survey of Mining Licence Holders and Prospecting Licence Holders.</i>						

It is notable that the greater majority of respondents (43%) indicated that they expect the industry to expand marginally (5-15% growth) in the medium term, while 14% believed that the industry has the potential to expand significantly (15%-40%). These views provide an insight into the general consensus among industry stakeholders about the future potential of the industry but should be interpreted with caution, particularly given the impact of recent closures in the industry.

5.3 Overall Conclusions

The evidence suggests that the economic value added contribution of the mining and mineral exploration industry to the Irish economy is considerable and far-reaching. The nature of the impact of the sector was evaluated through examining components such as employment, wages and salaries, non-labour and capital expenditures, contributions to the Exchequer in the form of taxes and payments to local authorities, and local community contributions. Of particular importance is the substantial number of jobs supported both directly and indirectly by mining and exploration activities, especially in the context of the high unemployment rates prevailing across many sectors of the economy at this time.

Annex 1 Copy of Survey Questionnaires

INDECON CONFIDENTIAL DATA REQUEST TO COMPANIES HOLDING MINING LICENCES/LEASES

We would be grateful if you could provide the information below confidentially to Indecon in the context of the assessment of the economic value of the Mineral Exploration and Mining Sector in Ireland.

If you operate more than one mine, please provide data to cover all operations. All data/information provided by individual member companies will be treated as Strictly Confidential and will not be shared with any third party. All data will be aggregated in anonymous form with the responses received from other operators and no information on individual operators will be disclosed in any way in our report.

Please note data should relate only to activity for your operating mines in Ireland and not to any prospecting licences which we are dealt with in a separate information request

1. Name of Lessee/Licensee: _____
2. Name and location of mine operation(s): _____
3. Please indicate below the total **Number of Persons Engaged** on a full-time and part-time basis in **Mining and support functions** in your operation(s) in 2011 and estimated 2012.

Employment in:	Full-Time Employment – Average Number during Year		Estimated Full-Time Equivalent Number of Part-Time Employment – Average Number during Year	
	2011	2012	2011	2012
Mining				
Exploration associated with Mines				
Other Support Activities*				
Total persons engaged				

*Other Support Activities include activities such as office employment and administration and technical and research activities.

4. (a) What percentage of your employment is accounted for by the following?: Skilled jobs % _____ Unskilled jobs % _____
Total 100%
(b) What percentage of your employment is accounted for by the following?: Graduates/post graduates % _____ Non-graduates % _____
Total 100%
5. Please indicate the overall **Sales Revenues/Turnover** from mining activities?
Sales Turnover – Mining Activities: 2011 - €: _____ Estimated 2012 - €: _____
6. Of your overall sales turnover from mining activities reported above, how much, if any, of this is exported to customers or affiliates overseas? **Export Sales:** 2011 - €: _____ Estimated 2012 - €: _____
7. Please provide below a breakdown of your total expenditures on **Wages & Salaries** in relation to your operating mines during 2011 and the estimate for 2012:
2011€ _____ 2012 € _____.

8. Please provide a breakdown of your purchases of **Irish-produced non-labour Business Inputs** during 2011 and 2012:

Irish-produced non-labour Business Inputs	2011 - €	Estimated 2012 - €
Sub-supplies / Finished Goods/ Raw Materials		
Professional Services		
Other Services Including Bought in Drilling Services, Laboratory and Other Services purchases		
Total Irish-produced Purchases		

9. (a) Please indicate your total **Investment/Capital Expenditure** in Ireland: 2011 €_____ Estimated 2012 €_____
- (b) Please indicate your best estimate of the percentage of your total investment/capital expenditure which is on imported capital expenditure in 2012: _____%.
10. Please indicate your total **R&D Expenditure** during 2011 and estimated for 2012. 2011 €_____ Estimated 2012 €_____
11. Please indicate your company's total **Tax Payments**, i.e. including income taxes (PAYE, PRSI and levies), net VAT, import duties and Corporation Tax): 2011 - €: _____ Estimated 2012 - €: _____.
12. Please indicate your company's **payments to local authorities** in form of rates / levies / service charges: 2011 €_____ Estimated 2012 €_____.
13. Does your company provide any other contributions, not otherwise identified in this questionnaire, to local, regional or national communities or organisations, such as for example sporting and other community organisations, sponsorship or other contributions? **Yes** ☐ **No** ☐ If 'Yes', please indicate the overall amount of expenditures on such contributions:
- 2011 €: _____ Estimated 2012 €: _____

Views on Future Opportunities for Minerals Exploration and Mining Industry in Ireland

14. Please give your opinion on the likely future output and economic opportunities for mineral exploration and mining industry in Ireland from existing mines and potential new discoveries:
- ☐ Likely to remain static; 15%) ☐ Likely to expand marginally (Circa 5% - 15%)
- ☐ Likely to decline marginally (circa 5%-15%); 40%) ☐ Likely to expand significantly (circa 15% - 40%)
- ☐ Likely to decline significantly (15%-40%); _____ ☐ Other please indicate: _____
15. If you have any additional data or information or case studies you could provide on the contribution of the minerals exploration and mining sectors to the wider Irish economy including support for services industries including drilling, laboratories etc, please supply this separately.

Thank you very much for your assistance with this important study for the Department of Communications, Energy and Natural Resources. If you have any queries re any aspect of the above, please contact William H. Batt at Indecon (E-mail: whbatt@indecon.ie).

INDECON CONFIDENTIAL DATA REQUEST TO MINING LICENCE HOLDERS AND PROSPECTING LICENCE HOLDERS

We would be grateful if you could provide the information below confidentially to Indecon in the context of the assessment of the economic value of the Mineral Exploration and Mining Sector in Ireland. All data/information provided by individual member companies will be treated as Strictly Confidential and will not be shared with any third party. All data will be aggregated in anonymous form with the responses received from other operators and no information on individual mining or prospecting licence holders will be disclosed in any way in our report.

Note: Please note data should relate to activities in respect of mining operations and also to any prospecting activities in Ireland.

1. **Name** of lessee/licensee (Mining Lease/Licence): _____
2. **Name** of licensee (Prospecting Licence): _____
3. Number of **Prospecting Licences** Held: 2011 _____ 2012 _____
4. Please indicate below the total **Number of Persons Engaged** on a full-time and part-time basis in your company in Mining, Exploration/Prospecting and in other supporting functions in 2011 and estimated 2012:

Employment in:	Full-Time Employment – Average Number during Year		Estimated Full-Time Equivalent Number of Part-Time Employment – Average Number	
	2011	2012	2011	2012
Mining Operations				
Exploration associated with mines				
Exploration / Prospecting activities within Prospecting Licence areas				
Other Support Activities*				
Total Persons Engaged				

*Other Support Activities include activities such as office employment and administration, technical and research activities.

5. (a) What percentage of your employment is accounted for by the following?: Skilled jobs % _____ Unskilled jobs % _____ Total 100%
 (b) What percentage of your employment is accounted for by the following?: Graduates/post graduates % _____ Non-graduates % _____ Total 100%
6. Please indicate your overall **Sales Revenues/Turnover**
 Sales Turnover: 2011 - €: _____ Estimated 2012 - €: _____

7. Of your overall sales turnover from mining activities reported above, how much, if any, of this is exported to customers or affiliates overseas?

Export Sales: 2011 - €: _____ Estimated 2012 - €: _____

8. Please indicate the total amount of **Exploration Expenditure** within Mining areas and Prospecting Licence areas in 2011 and estimated 2012:

Exploration Expenditure	2011	Estimated 2012
Exploration Expenditure (including wages & salaries and overheads)	€	€

9. Please indicate your overall expenditures on **Wages & Salaries** in relation to your Mining Operations and Prospecting Licence areas:

Wages & Salaries	2011	Estimated 2012
Total Wages & Salaries	€	€

10. Please provide an estimate of your purchases of **Irish Produced Non-Labour Inputs** in relation to your Mining Operations and Prospecting Licence areas in 2011 and estimated 2012:

Irish-produced non-labour Business Inputs - Mining Operations	2011 - €	Estimated 2012 - €
Sub-suppliers / Finished Goods/ Raw Materials		
Professional Services		
Other Services Including Bought in Drilling Services, Laboratory and Other Service purchases		
Total Irish-produced Purchases		

11. (a) Please indicate your total **Investment/Capital Expenditure** (if any) in your Mining Operations and Prospecting Licence Areas in 2011 and estimated 2012:

Investment/Capital Expenditure	2011 - €	Estimated 2012 - €
Total Investment/Capital Expenditure		

(b) Please indicate your best estimate of the percentage of your capital expenditure which is on imported capital expenditure 2012 _____%

12. Please indicate the total **R&D Expenditure** associated with your Mining Operations and Prospecting Licence Areas in 2011 and estimated 2012:

R&D Expenditure	2011 - €	Estimated 2012 - €
Total R&D Expenditure		

13. Please indicate your total **Tax Payments**, i.e. including income taxes (PAYE, PRSI and levies etc), Net VAT, import duties, corporation tax and other taxes, associated with your Mining Operations and Prospecting Licence Areas in 2011 and estimated 2012:

Tax Payments	2011 - €	Estimated 2012 - €
Total Tax Payments		

14. Please indicate your company's **Payments to Local Authorities** in the form of rates / levies / service charges:

Payments to Local Authorities	2011 - €	Estimated 2012 - €
Total Payments to Local Authorities		

15. Does your company provide any other contributions, not otherwise identified in this questionnaire, to local, regional or national communities or organisations, such as for example sporting and other community organisations, sponsorship or other contributions? **Yes** ☐ **No** ☐ If 'Yes', please indicate the overall amount of expenditures on such contributions:

2011 €: _____ Estimated 2012 €: _____

Views on Future Opportunities for Minerals Exploration and Mining Industry in Ireland

16. Please give your opinion on the likely future output and economic opportunities for mineral exploration and mining industry in Ireland from existing mines and potential new discoveries:
- | | |
|--|--|
| <input type="checkbox"/> Likely to remain static; 15%) | <input type="checkbox"/> Likely to <u>expand</u> marginally (Circa 5% - 15%) |
| <input type="checkbox"/> Likely to decline marginally (circa 5%-15%); 40%) | <input type="checkbox"/> Likely to <u>expand</u> significantly (circa 15% - 40%) |
| <input type="checkbox"/> Likely to decline significantly (15%-40%); _____ | <input type="checkbox"/> Other please indicate: |
17. If you have any additional data or information, or case studies, you could provide on the contribution of the minerals exploration and mining sectors to the wider Irish economy, including support for services industries including drilling, laboratories etc, please supply this separately.

Thank you very much for your assistance with this important study for the Department of Communications, Energy and Natural Resources. If you have any queries re any aspect of the above, please contact William H. Batt at Indecon (e-mail: whbatt@indecon.ie).

INDECON CONFIDENTIAL DATA REQUEST TO PROSPECTING LICENCE HOLDERS

We would be grateful if you could provide the information below confidentially to Indecon in the context of the assessment of the economic value of the Mineral Exploration and Mining Sector in Ireland.

All data/information provided by individual member companies will be treated as Strictly Confidential and will not be shared with any third party. All data will be aggregated in anonymous form with the responses received from other operators and no information on individual licence holders will be disclosed in any way in our report.

Note: Please note data should relate only to activity for your prospecting activities in Ireland and not to any operating mines, which are dealt with in a separate information request.

1. **Name** of licensee: _____
2. Number of **Prospecting Licences** Held: 2011 _____ 2012 _____
3. Please indicate below the total **Number of Persons Engaged** including employees and contractors on a full-time and part-time basis in your company in Exploration activities and in other supporting functions in 2011 and estimated 2012:

Employment in:	Full-Time Employment – Average Number during Year		Estimated Full-Time Equivalent Number of Part-Time Employment – Average Number during Year	
	2011	2012	2011	2012
Exploration / Prospecting				
Other Support Activities*				
Total Persons Engaged				

*Other Support Activities include activities such as office employment and administration, technical and research activities.

4. (a) What percentage of your employment is accounted for by the following?: Skilled jobs % _____ Unskilled jobs % _____ Total 100%

(b) What percentage of your employment is accounted for by the following?: Graduates/post graduates % _____ Non-graduates % _____ Total 100%

5. Please indicate the total amount of **Exploration Expenditure** in Prospecting Licence Areas?

	2011	Estimated 2012
Total Expenditure (including wages & salaries and overheads) within Prospecting Licence Areas	€	€

6. Please indicate your overall expenditures on **Wages & Salaries** in relation to your Prospecting Licence Areas:

2011 - € _____ Estimated 2012 - € _____

7. Please provide an estimate of your purchases of **Irish Produced Non-Labour Inputs** in relation to your prospecting activities.

Irish-produced non-labour Business Inputs	2011 - €	Estimated 2012 - €
Sub-suppliers / Finished Goods/ Raw Materials		
Professional Services		
Other Services Including Bought in Drilling Services, Laboratory and Other Service purchases		
Total Irish-produced Purchases		

8. (a) Please indicate **Capital Expenditure** (if any): 2011 - €: _____ Estimated 2012 - €: _____
 (b) Please indicate your best estimate of the percentage of your capital expenditure which is on imported capital expenditure 2012 _____%

9. Please indicate your total **R&D Expenditure**: 2011 - €: _____ Estimated 2012 - €: _____

10. Please indicate your company's total **Tax Payments**, i.e. including income taxes (PAYE, PRSI and levies etc., Net VAT and Other Taxes)

2011 €: _____ Estimated 2012 €: _____

11. Please indicate your company's **payments to Local Authorities** in form of rates / levies / service charges:

2011 € _____ Estimated 2012 € _____

12. Does your company provide any other contributions, not otherwise identified in this questionnaire, to local, regional or national communities or organisations, such as for example sporting and other community organisations, sponsorship or other contributions? **Yes** ☐ **No** ☐ If 'Yes', please indicate the overall amount of expenditures on such contributions:

2011 €: _____ Estimated 2012 €: _____

Views on Future Opportunities for Minerals Exploration and Mining Industry in Ireland

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☐ Likely to decline marginally (circa 5%-15%); 40%) ☐ Likely to expand significantly (circa 15% - 40%)
☐ Likely to decline significantly (15%-40%); ☐ Other please indicate: _____

14. If you have any additional data or information, or case studies, you could provide on the contribution of the minerals exploration and mining sectors to the wider Irish economy, including support for services industries including drilling, laboratories etc, please supply this separately.

Thank you very much for your assistance with this important study for the Department of Communications, Energy and Natural Resources. If you have any queries re any aspect of the above, please contact William H. Batt at Indecon (e-mail: whbatt@indecon.ie).