EXPLORATION AND MINING DIVISION IRELAND

ZINC • LEAD • COPPER • GOLD • SILVER • BARYTES • GYPSUM • COAL • DOLOMITE • TALC

THE "TOP 55" DEPOSITS

Department of Communications, Climate Action and Environment
The Mining Heritage

Ireland is richly endowed with a diversity of mineral deposits, with a mining heritage extending for over 4,000 years. Although much of the information is shrouded in time, enough remains to show that the country was firmly established as a significant metal producer at several distinct stages in history. During the Final Neolithic/Early Bronze Age (c.2400-1500 B.C.) Irish mines were an important source of copper, while alluvial gold may have been used for some of the abundant gold ornaments of this period. The 16th and 17th centuries were a time of extensive iron production, while the 19th century saw continuous copper, lead and silver output for over 70 years, as well as a “gold rush” around the start of the century. And finally, the period since the 1960s have seen Ireland enjoy the status of a world-ranked producer of zinc, lead and barite, and become one of the most promising exploration territories in Europe.

Historical Record

The first evidence of mineral deposits as an important resource in Ireland after the Stone Age is to be found in Bronze Age times (c.2300-500 B.C.) or a little earlier. Recent research has established that primitive copper mines were worked in SW Ireland in the period c.2400-1500 B.C., with the bulk of those dated during the period c.1700-1500 B.C. These mines were located both in mineralized quartz veins and sedimentary copper beds, as workings which rarely exceeded 10m in depth. Near-site smelting is likely, and the copper production made Ireland an important European producer of bronze axes and other utilitarian products during this time. The subsequent decline was probably due to the exhaustion of accessible mineralization. It is also likely that gold was first discovered during the Bronze Age, since there is reference to gold being found in c.1600 B.C. and worked at a site to the south of Dublin.

Few records remain of mining activity prior to the major period of mining in the 19th century. Sparse texts attest to iron working at Avoca in the 2nd century, to iron and copper mines in the 9th century, alum mining in the 12th century and lead-silver workings and copper mining around 1500. Better information exists for the 16th and 17th centuries however, which were marked by widespread iron production. Although iron ores were probably mined and smelted from shortly after the Bronze Age (500 B.C.), Irish production did not rise to prominence until this time, when iron became an important export to England. The ores worked were gossans from Avoca, carbonate ore (“ironstones”) from the coalfields, haematite, and the widespread ‘bog iron’ ore. As charcoal sources were exhausted the industry declined. The last charcoal furnace closed in 1765. Lead and silver were also mined in the 17th century at several locations (e.g. Silvermines).

The flowering of the metal mining industry in the late 18th and 19th centuries was triggered by the needs of the Industrial Revolution in Britain. Copper mining boomed in SW Ireland, especially in Allihies, but there was considerable lead, copper (e.g. Avoca) and silver mining elsewhere, with almost every coastal county having at least one mine, based on high-grade low-tonnage vein deposits (e.g. Bunnahon). This period also saw the main phase of coal mining (Rossmore and Ballingarry areas) and slate quarrying as well as pyrite from Avoca and manganese and barite production from southern Ireland, with mining employment at peaks never to be reached again. Fortunes were made and lost, not least during the “gold rush” between 1795 and 1830 at the Gold Mines River, where an estimated 7-9,000 oz of gold was extracted from alluvial gravels.

By the end of the 1880s however, a bleak period of some 70 years was to ensue. The exhaustion of deposits, falling metal prices and the lack of new discoveries saw the virtual cessation of metal mining. Up to the 1950s the only mining of note was a period of bauxite production in Northern Ireland, pyrite for sulphur from Avoca, and phosphate from Benbulben (1942-1960) and gyspum mining from the Kingscourt area from 1936 onwards. Coal mining continued from the Arigna, Rossmore and Ballingarry areas from thin seams, but output otherwise largely consisted of limestone for agricultural use and materials for the Irish construction industry.

The stage however had been set for the finest period in Irish mining history. A comprehensive Minerals Development Act (1940), followed by significant tax measures in the 1956 Finance Act, had a catalytic effect on mineral exploration by attracting a number of Canadian exploration companies to the country. Encouraged by the State discovery of economic reserves at the lead-zinc deposit in Lower Carboniferous rocks at Abbeytown (in production from 1950-1962), a surge of exploration focused in this stratigraphical level. Early confirmation of the existence of significant mineralization came with the discovery of the Ballyvergin copper deposit in 1957, followed by the Tynagh zinc-lead-silver orebody in 1961. It was the discovery of this latter deposit, in a geological setting which had not previously produced any significant mineralization, that set off a chain of discoveries (see Table). In 1962 the Silvermines zinc-lead orebody was discovered; this was followed by the world-class Ballynoe barite deposit, in its time the fifth largest barite producer in the world, and in 1964 the Gortdrum copper-silver-mercury deposit was found. All of these became profitable mines.
The “Top 55” Deposits

- **Tatestown (Zn, Pb)**
  The Tatestown Zn-Pb deposit is hosted within Lower Carboniferous shallow-water carbonates. Sulphides are generally stratiform and thicken in the immediate hangingwall of a northerly dipping E-W normal fault which transects the orebody. The mineralization is diagenetic and the deposit is regarded as a satellite to the major Navan orebody which is 3km to the southeast. The deposit contains 3.6Mt grading 6.9% Zn + Pb.

- **Tomduff (Andalusite)**
  Navan Resources discovered a significant andalusite prospect at Tomduff. Co. Carlow. Andalusite schists occur in a zone 200-300m in width and up to 5km long. Mineral processing studies demonstrated that 98% of the recoverable andalusite is within market specifications in terms of crystal size and alumina content.

- **Tynagh (Pb, Zn, Cu, Ag, Barite)**
  The Tynagh Pb-Zn-Cu-Ag-Barite deposit holds a special position in Ireland’s recent mining history. Discovered in 1961 by a group of Irishmen who had cut their teeth in the Canadian mining industry, the Tynagh deposit was the first major stratabound carbonate-hosted deposit discovered in Ireland. The deposit is also remarkable in an Irish context in that it yielded significant economic amounts of lead, zinc, copper, silver and barite.
  
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- **Westport (Talc)**
  The Westport talc-magnesite deposit occurs within a Pre-Cambrian serpentinite belt and has resulted from metamorphic alteration of the host lithology. Drilling and trenching has outlined an estimated 2Mt of 50% talc and 33% magnesite.

  Then in late 1970, the Navan deposit was discovered. Initial reserves for the deposit were almost 70 million tonnes grading 10% zinc and 2.5% lead, and production started in 1977. The discovery of the large tonnage Navan deposit put Ireland firmly on the international map and resulted in a large demand for prospecting licences. By the end of 1974, a total of 924 licences covering 32,000km² were current, accounting for almost 50% of the total land area of the Republic of Ireland. However, during the next twelve years, the efforts of the exploration companies resulted in what can only be described as technical successes. While a number of minor deposits (e.g. Tatestown, Courtbrough, Charlestown) were found, none were economic. This lack of success in the late 1970s led to many of the multinational exploration companies leaving Ireland. The resulting vacuum was filled by the formation of a number of junior Irish exploration companies, which kept alive the flame of exploration in Ireland, at a time of depressed base metal prices and relatively little funding available for base metal exploration. Fortunately, the discovery of the Curraghinalt gold prospect in Northern Ireland in 1983 proved that Ireland had real potential for bedrock gold. This and the high price of gold at the time enabled funding to be raised and led to a surge in gold exploration in Ireland between 1982 and 1988, with some success, notably the discovery of the Lecanvey and Cregganbaun deposits. However, in 1986, a more significant discovery was made, that of the Galmoy base metal deposit (6.18Mt, 11.31% Zn, 1.12% Pb). This sparked a revival in Ireland’s base metal industry, resulting in the return to Ireland of a number of multinational companies. Further success followed in 1990 with the discovery of the Lisheen deposit (18.9Mt, 12.75% Zn, 2.2% Pb). Additional significant mineralization has been outlined at both Navan and Galmoy: in 1999, a resource of 13.5Mt at 8.9% Zn and 1.1% Pb was outlined at Navan (the SWEX, or South West Extension), while mineralization discovered in 2002 (the R Zone) adjacent to the CW orebody is expected to result in a longer mine life at Galmoy.

  With all three mines (Navan, Galmoy, Lisheen) in full production, Ireland is firmly positioned as a major international producer of both zinc and lead, being the largest producer in Europe and among the ten largest in the world. The succession of discoveries since the late 1970s have demonstrated that Ireland hosts a zinc-lead province of considerable magnitude, ranked first in the world in terms of zinc metal discovered per sq. km, and second for lead.

<table>
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<tr>
<th>DEPOSIT</th>
<th>YEAR OF DISCOVERY</th>
<th>TONNAGE (Mt)</th>
<th>Zn+Pb %</th>
<th>Cu %</th>
<th>Ag g/t</th>
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<td>* Aherlow</td>
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<td>* Cregganbaun</td>
<td>1999</td>
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<td>* Lisheen</td>
<td>1990</td>
<td>18.9</td>
<td>14.95</td>
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The “Top 55” Deposits

- **Abbetown (Zn, Pb)**
  Stratabound sphalerite and galena occur in a Visean carbonate sequence. Textural evidence suggests that Abbetown is a replacement-style MVT deposit. Mined intermittently since 1785, most production took place between 1950 and 1962. Total production is estimated at 1.1 Mt grading 3.8% Zn, 1.5% Pb and 45 g/t Ag. Potential reserves of 1 Mt of ore-grade Zn, Pb and Ag have been outlined.

- **Aclare (Li)**
  Pegmatites along the eastern margin of the Leinster Granite locally contain spodumene. The pegmatites are up to 20m thick and 400m in length. Tin and niobium-tantalum minerals are common accessories. The pegmatites have a grade of 1.6% Li.

- **Aherlow (Cu, Ag)**
  The discordant Cu-Ag deposit at Aherlow is hosted in basal Carboniferous limestones and shales as well as in the underlying Devonian clastics. Mineralization occurs as a steeply-dipping shear zone on the northern limb of the Aherlow Syncline. A series of lenses containing chalcopyrite, bornite and chalcocite, each up to 30m wide, can be traced for 600m and to a depth of more than 250m. Diamond drilling has outlined a “geological tonnage of more than 6 Mt grading 0.89% Cu and 33.8 g/t Ag”.

- **Avoca (Cu)**
  A major Caledonian volcanogenic massive sulphide orebody; mining records for Avoca go back to the 16th century when iron was mined from the gossans in the sulphide lodes. Copper mining started around 1750. Chalcopyrite is the principal economic sulphide but sphalerite and galena are also found. Total production to 1982 was approx. 16 Mt grading 0.6% Cu. The copper concentrates contained payable levels of gold and silver.

- **Ballinalack (Zn, Pb)**
  The Ballinalack Zn-Pb deposit is hosted in basal Waulsortian (Lower Carboniferous) mudbank limestones similar to the Tynagh, Silvermines, Galway and Lisheen deposits. Weaker mineralization is found in the underlying Mixed Beds, the stratigraphic equivalent of which hosts the Navan deposit. At Ballinalack the Main Zone contains measured and indicated resources of 7.83 Mt grading 6.4% Zn and 1.8% Pb, the central core of which contains a measured resource of 2.2 Mt grading 8.1% Zn and 1.4% Pb.

- **Ballymoney, Northern Ireland (Lignite)**
  Drilling in the late 1980s confirmed the existence of a very significant near-surface deposit of Tertiary lignite at Ballymoney, Co. Antrim, in Northern Ireland. Six seam groups combine over a thickness of 70-180m to give a total of 620Mt of lignite.

**BALLYNOE**
At peak production of 100,000 tpa during the early 1980s, Ballynoe was the largest barite mine in Europe and provided 5% of world demand. Barite was mined continuously at Ballynoe for 30 years.

- **Ballynoe (Barite)**
  The stratiform barite deposit at Ballynoe occurs at the base of Waulsortian (Lower Carboniferous) mudbank limestones. The deposit is genetically related to the adjacent Silvermines sedes Zn-Pb deposits. Open pit mining began in 1965 and continued to the late 1980s; this was followed by underground mining to 1993 when the mine closed due to exhaustion of reserves. During its continuous 30 year operation the mine produced 5.13 Mt of ore at 90% BaSO4.

- **Ballyvourney (Cu)**
  The small Ballyvourney copper deposit occurs in basal carbonates and shales of the Lower Carboniferous. Disseminated, cross-cutting and replacive chalcopyrite, pyrite, arsenopyrite and galena are concentrated at the crest of a pericline. The mineralogy and the stratigraphic and structural setting are all similar to the other copper deposits in southern Ireland viz. Gortdram, Mallow and Aherlow. The deposit is estimated to contain 233,000 t Cu and 15 g/t Ag.

- **Ballynoke (Barite)**
  Barite was mined continuously at Ballynoe for 30 years. The mine closed in 1993 due to exhaustion of reserves. During its continuous 30 year operation the mine produced 5.13 Mt of ore at 90% BaSO4.

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greater part having been mined in the past 25 years. Current production is in the order of 500,000tpa. The gypsum is used locally to manufacture plasterboard. In 2004, Irish Gypsum received planning approval for the development of an underground mine at Drummond, adjacent to their current opencast operation.

• Lecanvey (Au)
Since the discovery of gold in south Co. Mayo by Tara Prospecting Ltd. in 1984, the area has been intensively explored for gold. Surface exploration during 1987 to 1989 by Burmin Exploration/Tara Prospecting confirmed the presence of significant gold mineralization in quartz veins in Silurian quartzites at Lecanvey. A geological reserve of 2004, Irish Gypsum received planning approval for the mining of barite cuts the massive Lower Carboniferous limestones of Benbulben Mountain, Co. Sligo. Averaging 1.2m in thickness, the vein has been worked intermittently since 1875. Approximately 100,000 tonnes of barite was produced between 1942 and 1960. More recently, approximately 10,000tpa was produced between 1973 and 1979.

• Mallow (Cu, Ag)
The Mallow Cu-Ag deposit is hosted in a Devonian/Carboniferous sandstone-shale sequence. A cross-cutting, near-vertical, 40m wide, 120m deep zone of vein-hosted and disseminated bornite and chalcocite occupies the central portion of a local monoclinal and accounts for 80% of the deposit. A shallow-dipping stratabound zone, which also contains tennantite and is up to 30m thick, intersects the base of the vertical zone. The deposit is estimated to contain 3.6Mt grading 0.7% Cu and 27.5g/t Ag of which the silver-rich stratabound zone contains 0.6Mt grading 150g/t Ag and 0.6% Cu.

• Moyvoughy (Zn, Pb)
At Moyvoughy both stratiform and cross-cutting Zn-Pb mineralization are hosted in shallow-water carbonates, the stratigraphic equivalent of the host to the major Navan Zn-Pb deposit. A small deposit of 125,000 tonnes grading 8% Zn + Pb was outlined.

• Murvey (Mo)
At Murvey a small molybdenum deposit is contained within the Carna Dome granodiorite, the westemmost expression of the composite Galway Granite (c. 400 Ma). Molybdenite occurs in early quartz veins and appears to be concentrated in a 500m long zone adjacent and parallel to the granodiorite margin. Drilling has established the presence of a small, low-grade, near-surface deposit containing 240,000t at 0.13% Mo.

• Navan (Zn, Pb)
The Navan Zn-Pb deposit is hosted in basal Carboniferous shallow-water carbonates. The deposit contains a stacked series of stratiform and stratobound sulphide lenses aligned approx. NNW and parallel with major faulting. This world-class orebody was discovered in 1977, and initial reserves were 69.9Mt at 10.01% Zn and 2.66% Pb. Underground mining commenced in 1977. In recent years near-mine exploration has defined further resources southwest and northeast of the main orebody, which will result in an extended mine life. A small Zn-Pb deposit at Clohmorey is replaced, the sulphides being hosted in a hydrothermal black matrix breccia. The primary controls on the distribution of the three zones of sulphide mineralization are two NE faults at the southern edge of the orebody. The initial mineable reserve was 18.94Mt at 12.75% Zn and 2.2% Pb. This is expected to support a mine life of 14 years. Mining commenced in late 1999 and, at full production, delivers 300,000tpa of zinc concentrates and 40,000tpa of lead concentrates. The mine is owned 100% by Anglo American PLC.

• Bennettsbridge (Dolomite)
A large resource of dolomite and dolomitic limestone occurs in Lower Carboniferous rocks near Bennettsbridge, Co. Kilkenny. Roadstone Provinces Ltd. operate the quarry and produce between 250,000 and 500,000t of dolomite annually. The dolomite is used for concrete aggregate, aggregate for tarmacadm and for fertiliser.

• Bohaun (Au)
An epithermal gold-bearing structure up to 160m wide and 160m long cuts a Silurian meta sedimentary sequence. trenching has yielded recent values of 40 to 190g/t Au across vein widths of 1 metre.

• Bunnahone (Cu)
The Bunnahone mine area is a number of historic copper mines. All are based on vein-type or sheet-hosted deposits of chalcopyrite in Ordovician volcanics and sediments. Although records are incomplete, they show that during 3800 to 1878 approximately 250,000t of dressed ore grading 10% Cu were produced. The average grade of mined ore was 3% Cu.

• Carrnew (Au)
Drilling by Irish Marine Oil on a gold-bearing structure in altered Ordovician metasediments and metavolcanics near Carrnew intersected significant gold values. Best intersection was 18.40g/t Au (with visible gold) over 0.5m at 1.9m depth, in a previous hole nearby had intersected 11.6g/t Au over 0.38m at a depth of 108m. Both intersections are believed to be from the same mineralized zone, the limits of which have yet to be defined.

• Charlestown (Cu)
The Charlestown Cu deposit is centred on a shallow Ordovician dacite complex. Significant sulphide mineralization is confined to a central silicic zone where chalcopyrite, sphalerite and galena occur in hydrothermal fractures. The deposit contains approx. 3Mt of 0.6% Cu with subsidiary Zn-Pb-Ag mineralization.

• Clonakilty (Barite)
A vein deposit of barite cuts Devonian and Carboniferous slates and sandstones on the southern coast of Ireland at Clonakilty, Co. Cork. The deposit comprises an almost vertical E-W vein averaging 2m in thickness, but locally up to 5m thick. The barite is generally high grade (locally of chemical grades) and has been in production sporadically since 1855. Records show that approximately 5,000tpa had been produced from 1876 to 1901. More recently 20,000tpa had been produced between 1979 and 1992, at which time it was estimated that 210,000t of recoverable reserves were present, two thirds of which was of direct shipping grade.

• Clontibret (Au)
The gold prospect at Clontibret, Co. Monaghan occurs in a sequence of Ordovician greywackes. The prospect comprises a number of lodes which were worked historically for antimony, and the gold occurs in late-stage arsenopyrite-stibnite veins. The gold is found in solid solution in arsenopyrite and pyrite as well as local inclusions of native gold within these sulphides. Drilling by Conroy Diamonds and Gold PLC has yielded best values of 16.24g/t Au over 2.42m (from 37m depth) and, in the same hole, 10.4g/t Au over 2.78m (from 56m). A second hole gave 2.9g/t Au over 4.31m (from 21m) and 5.2g/t Au over 1.30m (from 77m). More recent drilling intersected 6.23g/t Au over 1.50m (from 22.70m), including 0.3m of 21.75g/t Au, and 6.75m of 3.15g/t Au (from 78.50m).
**The “Top 55” Deposits**

- **Courthbrown (Zn, Pb)**
  Situated on the southern shore of the Shannon estuary, the Courthbrown Zn-Pb-Ag deposit is hosted in basal Waulsortian (Lower Carboniferous) mudbank micrite. Although the overall habit of the deposit is strataform, mineralization is both cross-cutting and semi-massive. Reserves of 1Mt at 5.5% Zn + 4 Pt (2.1) include possible and inferred categories. There are probable reserves of 300,000t grading 8.2% Zn + 1.4Ag + 5Cu.

- **Cregganbaun (Au)**
  The Cregganbaun gold deposit is hosted in an E-W shear zone which strikes through the central part of the Ordovician sequence of the South Mayo Trough. Gold mineralization is found along the shear zone over a distance of 1300m. The lithological assemblage in the vicinity of the shear zone includes feldspathic tufts, turbidites (containing chromite and fuchsite), ultramafic rocks of listvenitic character, and lamprophyre and phorrophyry dykes. Native gold is commonly visible in quartz veins. It is estimated, based on drilling, that the Cregganbaun East Zone contains 35,000t at 6g/t Au over a depth of 80m. At Cregganbaun West, bedrock sampling has yielded values of up to 280g/t Au in one metre channel samples.

- **Crumlin, Northern Ireland (Lignite)**
  Three separate lignite seam groups occur at Crumlin, Co. Antrim, in Northern Ireland. An extensive drilling programme has been carried out on the deposit by Antrim Coal Company Ltd. The seam groups vary in thickness up to a maximum of 63.5m and the deposit is reported to contain several hundred million tonnes of lignite.

- **Curraghinalt (Zn, Pb)**
  Curraghinalt in Northern Ireland is the 8th largest producer of zinc concentrates in Europe and the second largest producer of lead concentrates. Curraghinalt now ranks as the 8th largest producer of zinc concentrates in the world and as the 12th largest producer of lead concentrates. The Lishine mine having come on stream in 1999, Ireland now has three underground Zn-Pb mines viz. Navan, Galway and Lishine. Annual total production from the three mines will be in the order of 700,000 tonnes of zinc concentrate and 110,000 tonnes of lead concentrate.

- **Derrylkeen (Zn, Pb)**
  Diamond drilling at Derrylkeen 1987 intersected 19.5 Cd, 4.17% Cu and 25.1g/t Ag. Subsequently the ore was found to contain recoverable quantities of mercury. Due to problems of stability in the open pit, it was not possible to mine the deepest parts of the orebody. Subeconomic mineralization, identical to that of the ore, continues for several thousand feet beneath the deposit.

- **Duncornick (Zn, Pb)**
  Epigenetic Zn and Pb sulphides occur within two dolomite horizons near the base of the Lower Carboniferous carbonate sequence. Grades are up to 12% Zn over 1m, but are more commonly 5-6% Zn over 3 to 10 metres.

- **Galmoy (Zn, Pb)**
  The Galmoy Zn-Pb deposit is hosted in a rock matrix breccia at the base of dolomitized Waulsortian (Lower Carboniferous) mudbank limestone. There are two orebodies approx. 1km apart and at 70m depth. The CW orebody is 700m by 450m and has an average thickness of 6m. The G orebody is 450m x 390m and has an average thickness of 8m. Underground mining commenced in March 1997. The known mineable reserves of 6.2Mt at 11.31% Zn and 1.12% Pb were subsequently increased, while drilling in 2002 outlined another zone of very significant mineralization 200m southeast of the CW orebody. A long-stripped silver deposit. The mine life is expected to extend to 2012.

- **Glengevil (Gypsum)**
  The Glengevil gypsum deposit occurs in near-shore sediments of the upper part of the Lower Carboniferous. There is an estimated in situ resource of 14.8Mt of which 8Mt at 78% gypsum is thought to be recoverable.

- **Gold Mines River (Au)**
  The Gold Mines River in Co. Wicklow was the site of intensive alluvial gold mining in the late 18th and early 19th centuries. Total production has been estimated at 300kg of gold, although the true figure is likely to be higher, as much of the mining was unauthorised.

- **Gortdrum (Cu, Ag, Hg)**
  The Gortdrum Cu-Ag-Hg orebody is a hydrothermal mineralized body deposited emplaced during the late Carboniferous (at least) in basal Carboniferous limestones. The deposit is spatially related to both an ENE normal fault system and to high-level basic intrusions. Ore reserves were initially calculated at 3.8Mt containing 1.19% Cu and 25.1g/t Ag. Subsequently the ore was found to contain recoverable quantities of mercury. Due to problems of stability in the open pit, it was not possible to mine the deepest parts of the orebody. Subeconomic mineralization, identical to that of the ore, continues for several thousand feet beneath the deposit.

- **Harberton Bridge (Zn, Pb)**
  The Zn-Pb mineralization at Harberton Bridge is contained in a series of brecia pipes. These brecia occur through 500m of the Lower Carboniferous carbonate sequence, although they are best developed at the base of the Waulsortian mudbank micrite. The Harberton Bridge mineralization is distinctly different than that of the major deposits at Navan, Silvermines and Tynagh, and is comparable to some Cretaceous deposits. Four distinct zones of mineralization are found, with a total indicated resource of 3.7 Mt grading 8.8% Zn and 1.1% Pb.

- **Inishannon (Zn, Pb)**
  Structurally-controlled Zn-Pb mineralization cross-cuts Carboniferous carbonates and clastic sediments of the South Munster basin. High-grade sphalerite-galena veins dip steeply to the north, massive pyrite, apparently stratiform, and cross-cut by fracture-fill sphalerite and galena, is found in the lower part of the succession. Best values are 12.4% Zn and 3.8% Pb over 3.4m, and 6.2% Zn and 5.6% Pb over 8m.

**GORTDRUM**

The Gortdrum mine in Co. Tipperary is the only recently-discovered copper-silver deposit in Ireland to have been mined. It is also unique as the only mine to have produced mercury. The mine was worked on a newly discovered copper-mercury-gold deposit, gortdrumite (CuFe2(S,Hg)3S8).

- **Inishitark (Au)**
  On the island of Inishitark gold occurs in quartz veins in Ordovician metasediments. The occurrence is at the western extension of the auriferous Cregganbaun Shear Zone. Channel samples have assayed from 4.3 to 31.4g/t Au over widths of 0.6 to 2.0 metres.

- **Kedrah (Dolomite)**
  A deposit of pure dolomite has been identified at Kedrah in southeast Tipperary. Waulsortian limestone here has been heavily dolomitised and contains in excess of 20% MgO and less than 1% Fe2O3. Drilling has outlined reserves of some 1.5Mt and an inferred resource of 4.5Mt.

- **Kilgeever (Au)**
  At Kilgeever gold is found in quartz veins in Shuanan quartizes. A 0.35 bulk sample assayed 6.7g/t Au and sub-economic grades have been encountered by drilling to the east and west. The prospect is along strike to the west from the Lecanvey deposit.

- **Kilmacoo (Au)**
  The discovery in 1993 of visible gold in quartz veins in Ordovician volcanogenic massive sulphide deposit of Avoca, gold is found in a succession of tufts, felsites and pelites. Although no resource estimate has been published, twenty drillholes indicated the presence of 300,000 - 500,000t at 1.5-2g/t Au over a strike length of 125m. The limits of the mineralized zone have not been defined along strike or at depth.

- **Kilroot, Northern Ireland (Salt)**
  Bedded salt was been worked in the area of Kilroot, Northern Ireland, for more than a hundred years. Prior to 1958 the salt was worked by brine pumping. In 1965 Irish Salt Mining and Exploration Co. Ltd commenced underground dry mining of the five distinct beds of Triassic salt. The beds vary in thickness from 6m to 20m with significant lateral variation in thickness of all beds. The rock salt is processed on site and is used for winter road maintenance in the UK, Ireland and the USA. Production depends upon demand but averages 400,000tpa. Considerable reserves are believed to exist.

- **Kingscourt (Gypsum)**
  Mining of gypsum has been carried out continuously at Kingscourt since 1936. The gypsum occurs in a Permian mudstone sequence and has been mined both underground and in open-pits. Production to date exceeds 12Mt, with the...
The “Top 55” Deposits

- **Courtbrown (Zn, Pb)**
  - Situated on the southern shore of the Shannon estuary, the Courtbrown Zn-Pb-Ag deposit is hosted in basai Waulsortian (Lower Carboniferous) mudbank micrite. Although the overall habit of the deposit is stratiform, mineralization is both cross-cutting and semi-massive. Reserves of 1Mt at 5.5% Zn + 5% Ag include possible and inferred categories. There are probable reserves of 300,000rt grading 8.25% Zn + 5% Ag and 1.5% Pb.

- **Cregganbaun (Au)**
  - The Cregganbaun gold deposit is hosted in an E-W shear zone which strikes through the central part of the Ordovician sequence of the South Mayo Trough. Gold mineralization is found along the shear zone over a distance of 1300m. The mineral assemblage in the vicinity of the shear zone includes feldspathic tuffs, turbidites (containing chertm and fuchsite), ultramafic rocks of lherzolitic character, and lamprophyre and porphyry dykes. Native gold is commonly visible in quartz veins. It is estimated, based on drilling, that the Cregganbaun East Zone contains 530,000t at 6g/t Au over a depth of 80m. At Cregganbaun West, bedrock sampling has yielded values of up to 280g/t Au in one metre channel samples.

- **Crumlin, Northern Ireland (Lignite)**
  - Three separate lignite seam groups occur at Crumlin. Antrim, in Northern Ireland. An extensive drilling programme has been carried out on the deposit by Antrim Coal Company Ltd. The seam group vary in thickness up to a maximum of 65m and the deposit is reported to contain several hundred million tonnes of lignite.

- **Curraghinalt, Northern Ireland (Au)**
  - At Curraghinalt, in Northern Ireland, gold is associated with pyrite in steeply-dipping quartz veins in Dalradian metasediments. Drilling and underground development has outlined a measured and indicated resource of 460,000ton grading 16.9g/t Au. The deposit is undergoing further evaluation.

- **Derrykearn (Zn, Pb)**
  - Diamond drilling at Derrykearn in 1987 intersected 19.5 feet grading 13.8% Zn and 3.21g/t Ag. The prospect lies on the NE-SW ‘Rathdowney trend’ which contains the Lisheen and Galway orebodies. Lower Carboniferous carbonates-hosted sulphide mineralization is described as being in a typical geological setting to that of the Galway deposit.

- **Duncormick (Zn, Pb)**
  - Epigenetic Zn and Pb sulphides occur within two dolomite horizons near the base of the Lower Carboniferous carbonate sequence. Grades are up to 12% Zn over 1m, but are more commonly 5-6% Zn over 3 to 10 metres.

- **Galmoy (Zn, Pb)**
  - The Galloy Zn-Pb deposit is hosted in a rock matrix breccia at the base of dolomitized Waulsortian (Lower Carboniferous) mudbank limestone. There are two orebodies: approx. 1km apart and at 70m depth. The CW orebody is 700m by 450m and has an average thickness of 6m. The G orebody is 450m x 390m and has an average thickness of 8m. Underground mining commenced in March 1997. The known mineable reserves of 6.2Mt at 11.31% Zn and 1.12% Pb were subsequently increased, while drilling in 2002 outlined another zone of very significant mineralisation 200m southeast of the CW orebody. Anom International Resources believe that the mine life will be extended to 2012.

- **Glacevlin (Gypsum)**
  - The Glacevlin gypsum deposit occurs in near-shore sediments of the upper part of the Lower Carboniferous. There is an estimated in situ resource of 14.8Mt of which 8Mt at 78% gypsum is thought to be recoverable.

- **Gold Mines River (Au)**
  - The Gold Mines River in Co. Wicklow was the site of intensive alluvial gold mining in the late 18th and early 19th centuries. Total production has been estimated at 300kg of gold, although the true figure is likely to be higher, as much of the mining was unauthorised.

- **Gortdrum (Cu, Ag, Hg)**
  - The Gortdrum Cu-Ag-Hg orebody is a hydrothermal deposit emplaced during the late Carboniferous (at least) in basal Carboniferous limestones. The deposit is spatially related to both an ENE normal fault system and to high-level basic intrusions. Ore reserves were initially calculated at 3.8Mt containing 1.19% Cu and 25.1g/t Ag. Subsequently the ore was found to contain recoverable quantities of mercury. Due to problems of stability in the open pit, it was not possible to mine the deepest parts of the orebody. Subeconomic mineralisation, identical to that of the ore, continues for several thousand feet beneath the deposit.

- **Harberton Bridge (Zn, Pb)**
  - The Zn-Pb mineralization at Harberton Bridge is contained in a series of breccia pipes. These breccias occur through 500m of the Lower Carboniferous carbonate sequence, although they are best developed at the base of the Waulsortian mudbank micrite. The Harberton Bridge mineralization is distinctly different than that of the major deposits at Navan, Silvermines and Tynagh, and is comparable to classic MVT deposits. Four distinct zones of mineralization are found, with a total indicated resource of 3.7 Mt grading 8.8% Zn and 1.1%Pb.

- **Inishannon (Zn, Pb)**
  - Structurally-controlled Zn-Pb mineralization cross-cuts Carboniferous carbonates and classic sediments of the South Munster basin. Narrow high-grade sphalerite-galena veins dip steeply to the north, massive pyrite, apparently stratiform, and cross-cut by fracture-fill sphalerite and galena, is found in the lower part of the succession. Best values are 12.4% Zn and 3.8% Pb over 3.4m, and 6.2% Zn and 5.6% Pb over 8m.

- **Inishtrahull (Au)**
  - On the island of Inishtrahull gold occurs in quartz veins in Ordovician metasediments. The occurrence is at the western extension of the auriferous Cregganbaun Shear Zone. Channel samples have assayed from 4.3 to 31.4g/t Au over widths of 0.6 to 2m 20 metres.

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- **Keel (Zn, Pb, Barite)**
  - The Keel Zn-Pb deposit occurs as disseminations and as stockwork sulphide mineralization in Upper Devonian and Lower Carboniferous limestones. The deposit is spatially related to both an ENE normal fault system and to high-level basic intrusions. Ore reserves were initially calculated at 3.8Mt containing 1.19% Cu and 25.1g/t Ag. Subsequently the ore was found to contain recoverable quantities of mercury. Due to problems of stability in the open pit, it was not possible to mine the deepest parts of the orebody. Subeconomic mineralisation, identical to that of the ore, continues for several thousand feet beneath the deposit.

- **Kilibrackan (Calcite)**
  - A high-purity calcite deposit at Kilibrackan occurs in Lower Carboniferous limestones. The deposit contains a measured resource of 900,000t in excess of 99.9% CaCO3.

- **Kildare (Au)**
  - The discovery in 1993 of visible gold in quartz float in Co. Kildare, southeast of Dublin, made this region of Lower Palaeozoic greywackes a new target area.

- **Kilgeever (Au)**
  - At Kilgeever gold is found in quartz veins in Shuanth quartzites. A 0.35 bulk sample assayed 6.7g/t Au and sub-economic grades have been encountered by drilling to the east and west. The prospect is along strike to the west from the Lecanvey deposit.

- **Kilmore, County Mayo (Cu)**
  - Isle of Mulliner in the northwest of the Ordovician volcanogenic massive sulphide deposit of Avoa, gold is found in a succession of tufts, felsites and pellets. Although no resource estimate has been published, twenty drillholes indicated the presence of 300,000-500,000t at 1.5-2.5g/t Au over a strike length of 125m. The limits of the mineralised zone have not been defined along strike or at depth.

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**GORTDRUM**

The Gortdrum mine in Co. Tipperary is the only recently-discovered copper-silver deposit in Ireland to have been mined. It is also unique as the only mine to have produced mercury. The mine was the site of Kingstown’s recently-discovered copper-mercury-gold deposit, gortdrumite (CuFgsHg3S5).
greater part having been mined in the past 25 years. Current production is in the order of 500,000tpa. The gypsum is used locally to manufacture plasterboard. In

**Lisheen (Zn, Pb)**

Since the discovery of gold in south Co. Mayo by Tara Prospecting Ltd. in 1984, the area has been intensively explored for gold. Surface exploration during 1987 to 1989 by Burnin Exploration/Tara Prospecting confirmed the presence of significant gold mineralization in quartz veins in Silurian quartettes at Lisheen. A geological reserve of 490,000t grading at least 9.94g/t Au has been outlined by drilling. The Lisheen deposit occurs on the flank of Crough Patrick mountain. Given the religious and cultural significance of Crough Patrick, in May 1990 the Minister for Energy decided not to renew the Prospecting Licence over the area of the Lisheen deposit. Adjacent areas with gold mineralization similar to that at Lisheen are available for application.

The “Top 55” Deposits

**American PLC.**

The mine is owned 100% by Anglo American PLC.

**Navan (Zn, Pb)**

The Lisheen-Zn-Pb deposit occurs mainly in dolomitized Waulsortian (Lower Carboniferous) limestones, with subordinate mineralization found in an underlying oolite member. Although the deposit is stratiform, textural evidence shows the sulphides in the Waulsortian to be replacive, the sulphides being hosted in a hydrothermal black matrix breccia. The primary controls on the distribution of the three zones of sulphide mineralization are two NE faults at the southern edge of the orebody. The initial mineable reserve was 18.4Mt at 12.75% Zn and 2.2% Pb. This is expected to support a mine life of 14 years. Mining commenced in late 1999 and, at full production, delivers 300,000tpa of zinc concentrates and 40,000tpa of lead concentrates. The mine is owned 100% by Anglo American PLC.

**Mallow (Cu, Ag)**

The Mallow Cu-Ag deposit is hosted in a Devonian/Carboniferous sandstone-shale sequence. A cross-cutting, near-vertical, 40m wide, 120m deep zone of vein-hosted and disseminated bornite and chalcopyrite occupies the central portion of a local monocline and accounts for 80% of the deposit. A shallow-dipping stratabound zone, which also contains tennantite and is up to 10m thick, intersects the base of the vertical zone. The deposit is estimated to contain 3.6Mt grading 0.7% Cu and 27.5g/t Ag of which the silver-rich stratabound zone contains 0.6Mt grading 150g/t Ag and 0.6% Cu.

**Moyvougly (Zn, Pb)**

At Moyvougly both stratiform and cross-cutting Zn-Pb mineralization are hosted in shallow-water carbonates, the stratigraphic equivalent of the host to the major Navan Zn-Pb deposit. A small deposit of 125,000t grading 8% Zn + Pb was outlined.

**Murvey (Mo)**

At Murvey a small molybdenum deposit is contained within the Carna Dome granodiorite, the westemmost expression of the composite Galway Granite (c. 400 Ma). Molybdenite occurs in early quartz veins and appears to be concentrated in a 500m long zone adjacent and parallel to the granodiorite margin. Drilling has established the presence of a small, low-grade, near-surface deposit containing 240,000t grading 0.13% Mo.

**Bennettsbridge (Dolomite)**

A large resource of dolomite and dolomitetic limestone occurs in Lower Carboniferous rocks near Bennettsbridge, Co. Kilkenny. Roadstone Provinces Ltd. operate the quarry and produce between 250,000 and 500,000t of dolomite annually. The dolomite is used for concrete aggregate, aggregate for tarmacadam and for fertilizer.

**Bohan (Au)**

An epithermal gold-bearing structure up to 160m wide and 1600m long cuts a Silurian metasedimentary sequence. Trenching has yielded recent values of 40 to 190g/t Au across vein widths of 1 metre.

**Bunnahon (Cu)**

The Bunnahon area contains many of historic copper mines. All are based on vein-type or shear-hosted deposits of chalcopyrite in Ordovician volcanics and sediments. Although records are incomplete, they show that during 1800 to 1878 approximately 250,000t of dressed ore grading 10% Cu were produced. The average grade of mined ore was 3% Cu.

**Carnew (Au)**

Drilling by Irish Marine Oil on a gold-bearing structure in altered Ordovician metasediments and metavolcanics near Carnew intersected significant gold values. Best intersection was 18.48g/t Au (with visible gold) over 0.5m at depth, in a previous hole already had intersected 11.6g/t Au over 0.38m at a depth of 108m. Both intersections are believed to be from the same mineralized zone, the limits of which have yet to be defined.

**Carrickittle (Zn, Pb)**

Epigenetic Pb-Zn mineralization occurs in basal Waulsortian (Lower Carboniferous) mudbank limestones. Massive and disseminated/strungier mineralization are found, and the base rocks can be dolomitized or undolomitized. Although the discontinuous nature of the mineralization does not allow for the calculation of a tonnage, 17 out of 33 drillholes averaged 3m grading 6% Zn and 1.5% Pb.

**Cavanacaw, Northern Ireland (Au)**

The gold deposit at Cavanacaw, in Northern Ireland, is hosted in steeply-dipping quartz veins and shear fractures in Ordovician metasediments. The gold infills microfractures or forms discrete grains within lead, copper and iron sulphides. A proven and probable reserve of 367,000 tonnes grading 7.52 g/t Au over a width of 4.4m was estimated for the main Kearney deposit from surface to a depth of 37m. A further indicated reserve of 1.18 Mt at a grade of 7.02 g/t Au over a width of 4.4m was estimated from 37m to a depth of 117m. A small-scale opencast operation is in progress by the operator and owner, Galantas Gold Corporation, who sell the gold as jewellery through their wholly owned subsidiary Galantas Irish Gold Limited.

**Charlestown (Cu)**

The Charlestown Cu deposit is centred on a shallow Ordovician dacite complex. Significant sulphide mineralization is confined to a central silicic zone where chalcopyrite, sphalerite and galena occur in hydrofractures. The deposit contains approx. 3Mt of 0.6% Cu with subsidiary Zn-Pb-Ag mineralization.

**Clonakilty (Barite)**

A vein deposit of barite cuts Devonian and Carboniferous slates and sandstones on the southern coast of Ireland at Clonakilty, Co. Cork. The deposit comprises an almost vertical E-W vein averaging 2m in thickness, but locally up to 5m thick. The barite is generally high grade (locally of chemical grade) and has been in production sporadically since 1855. Records show that approximately 5,000tpa had been produced from 1876 to 1901. More recently, 20,000 tpa had been produced between 1979 and 1992, at which time it was estimated that 210,000t of recoverable reserves were present, two thirds of which was of direct shipping grade.

**Clontibret (Au)**

The gold prospect at Clontibret, Co. Monaghan occurs in a sequence of Ordovician greywackes. The prospect comprises a number of lodes which were worked historically for antimony, and the gold occurs in late-stage arsenopyrite-stibnite veins. The gold is found in solid solution in arsenopyrite and pyrite as well as local inclusions of native gold within these sulphides. Drilling by Conroy Diamonds and Gold PLC has yielded best values of 16.24g/t Au over 2.42m (from 37m depth) and, in the same hole, 10.48g/t Au over 2.78m (from 56m). A second hole gave 2.91g/t Au over 4.79m (from 21m) and 5.2g/t Au over 1.38m (from 77m). More recent drilling intersected 6.23g/t Au over 1.50m (from 22.70m), including 0.3m of 21.73g/t Au, and 6.73m of 3.15g/t Au (from 78.50m).
The “Top 55” Deposits

• **Abbetown (Zn, Pb)**
  Stratabound sphalerite and galena occur in a Visian carbonate sequence. Textural evidence suggests that Abbetown is a replacement-style MVT deposit. Mined intermittently since 1879, most production took place between 1950 and 1982. Total production is estimated at 1.1 Mt grading 3.8% Zn, 1.5% Pb and 45 g/t Ag. Potential reserves of 1 Mt of ore-grade Zn, Pb and Ag have been outlined.

• **Aclare (Li)**
  Pegmatites along the eastern margin of the Leinster Granite locally contain spodumene. The pegmatites are up to 20 m thick and 400 m in length. Tin and niobium-tantalum minerals are common accessories. The pegmatites have a grade of 1.6% Li.

• **Aherlow (Cu, Ag)**
  The discordant Cu-Ag deposit at Aherlow is hosted in basal Carboniferous limestones and shales as well as in the underlying Devonian clastics. Mineralization occurs as a steeply-dipping shear zone on the northern limb of the Aherlow Syncline. A series of lenses containing chalcopyrite, bornite and chalcocite, each up to 30 m wide, are present in the basement rocks. During 1957-61 an exploration programme included dewatering of the veins in Devonian slates and sandstones. During 1957-61 copper mineralization occurs in steeply-dipping quartz carbonate sequence. Textural evidence suggests that mineralization is discordant to the underlying Devonian clastics and Lower Palaeozoic slates. The deposit occurs at the base of a Waulsortian (Lower Carboniferous) mudbank limestones similar to the Tynagh, Silvermines, Galmoy and Lisheen deposits. Weaker mineralization is found in the underlying Mixed Beds, the stratigraphic equivalent of which hosts the Navan deposit. At Ballynallack the Main Zone contains measured and indicated resources of 7.83 Mt grading 6.4% Zn and 1.8% Pb, the central core of which contains a measured resource of 3.2 Mt at 8.1% Zn and 1.4% Pb.

• **Ballymoneyp, Northern Ireland (Lignite)**
  Drilling in the late 1980s confirmed the existence of a very significant near-surface deposit of Tertiary lignite at Ballymoneyp, Co. Antrim, in Northern Ireland. Six seam groups combine over a thickness of 70-180 m to give a total of 620 Mt of lignite.

• **Ballynoe (Barite)**
  Barite was mined continuously at Ballynoe for 30 years. At peak production of 300,000 tpa during the early 1980s, Ballynoe was one of the largest barite mines in Europe and one of the largest in the world. Initial reserves were 69.9 Mt at 10.1% Zn and 2.6% Pb. Mining commenced in 1977 and reserves are sufficient to sustain mining until at least 2010.

• **Ballynallack (Zn, Pb)**
  The Ballynallack Zn-Pb deposit is hosted in basal Waulsortian (Lower Carboniferous) mudbank limestones similar to the Tynagh, Silvermines, Galmoy and Lisheen deposits. Weaker mineralization is found in the underlying Mixed Beds, the stratigraphic equivalent of which hosts the Navan deposit. At Ballynallack the Main Zone contains measured and indicated resources of 7.83 Mt grading 6.4% Zn and 1.8% Pb, the central core of which contains a measured resource of 3.2 Mt at 8.1% Zn and 1.4% Pb.

• **Ballymoney, Co. Antrim, in Northern Ireland (Slate)**
  The small Ballyvergin copper deposit occurs in basal Carboniferous limestones and shales of the Lower Carboniferous. Dissiminated, cross-cutting and replacive chalcopyrite, pyrite, arsenopyrite and galena are concentrated at the crest of a pericline. The mineralogy and the stratigraphic and structural setting are all similar to the other copper deposits in southern Ireland viz. Gordrum, Mallow and Aherlow. The deposit is estimated to contain 233,000 t grading 0.97% Cu and 15 g/t Ag.

• **Ballyvoreen (Cu)**
  The small Ballyvoreen copper deposit occurs in basal Carboniferous limestones and shales of the Lower Carboniferous. Dissiminated, cross-cutting and replacive chalcopyrite, pyrite, arsenopyrite and galena are concentrated at the crest of a pericline. The mineralogy and the stratigraphic and structural setting are all similar to the other copper deposits in southern Ireland viz. Gordrum, Mallow and Aherlow. The deposit is estimated to contain 233,000 t grading 0.97% Cu and 15 g/t Ag.

• **Barrow (Zn, Pb)**
  The Barrow Zn-Pb deposit occurs in basal Carboniferous shallow-water carbonates which have been correlated with part of the main mineralized unit at Navan. However, the sulphide mineralization is clearly related to faulting. Best intersections to date are in the order of one metre grading 6.3% Zn + Pb.

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  Barite was mined continuously at Ballynoe for 30 years. At peak production of 300,000 tpa during the early 1980s, Ballynoe was one of the largest barite mines in Europe and one of the largest in the world. Initial reserves were 69.9 Mt at 10.1% Zn and 2.6% Pb. Mining commenced in 1977 and reserves are sufficient to sustain mining until at least 2010.

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## “Top 55” Commodity List

<table>
<thead>
<tr>
<th><strong>Base Metal Deposits</strong></th>
<th><strong>Gold Deposits</strong></th>
<th><strong>Industrial Minerals</strong> (Incl. Lignite)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbeytown (Zn, Pb)</td>
<td>Bohaun</td>
<td>Ballymoney, N. Ireland (Lignite)</td>
</tr>
<tr>
<td>Aclare (Li)</td>
<td>Carnew</td>
<td>Ballynoe (Barite)</td>
</tr>
<tr>
<td>Aberlow (Cu, Ag)</td>
<td>Cavanacaw, N. Ireland Clontibret</td>
<td>Benbulben (Barite)</td>
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<tr>
<td>Allihies (Cu)</td>
<td></td>
<td>Bennettsbridge (Dolomite)</td>
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<tr>
<td>Avoca (Cu)</td>
<td></td>
<td>Clonakilty (Barite)</td>
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<tr>
<td>Ballinalack (Zn, Pb)</td>
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<td>Kildare, N. Ireland (Lignite)</td>
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<td>Ballyvergin (Cu)</td>
<td>Inishturk</td>
<td>Kedrah (Dolomite)</td>
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<td>Bunnahon (Cu)</td>
<td>Kildare</td>
<td>Kilbreckan (Calcite)</td>
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<tr>
<td>Carrickittle (Zn, Pb)</td>
<td>Kilgeever</td>
<td>Kilroot, N. Ireland (Salt)</td>
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<tr>
<td>Charlestown (Cu)</td>
<td>Kilmacoo</td>
<td>Kingscourt (Gypsum)</td>
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<tr>
<td>Courtbrow (Zn, Pb)</td>
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<td>Portroe (Slate)</td>
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<tr>
<td>Derrykearn (Zn, Pb)</td>
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<td>Sandy Braes, N. Ireland (Perlite)</td>
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<td>Duncormick (Zn, Pb)</td>
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<td>Tomduff (Andalusite)</td>
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<tr>
<td>Galmoy (Zn, Pb)</td>
<td>Lecanvey</td>
<td>Westport (Talc)</td>
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<td>Gortdrum (Cu, Ag, Hg)</td>
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<tr>
<td>Harberton Bridge (Zn, Pb)</td>
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<td>Inishannon (Zn, Pb)</td>
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<td>Keel (Zn, Pb, Barite)</td>
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<td>Lisheen (Zn, Pb)</td>
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<td>Mallow (Cu, Ag)</td>
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<td>Moyvouglyh (Zn, Pb)</td>
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<td>Murvey (Mo)</td>
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<td>Navan (Zn, Pb)</td>
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<td>Newtown Cashel (Zn, Pb)</td>
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<td>Oldcastle (Zn, Pb)</td>
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<td>Silvermines (Zn, Pb)</td>
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<td>Tatestown (Zn, Pb)</td>
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<tr>
<td>Tynagh (Pb, Zn, Cu, Ag, Barite)</td>
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</tbody>
</table>
Generalized Geology of Ireland showing “Top 55” Mineral Deposits

- Upper Carboniferous & Younger
- Lower & Middle Carboniferous
- Devonian
- Lower Palaeozoic
- Dalradian (Late Proterozoic / Cambrian)
- Pre-Dalradian
- Granite

- BELFAST
- DERRY
- DUBLIN
- LIMERICK
- GALWAY
- CORK

- Undeveloped gold deposit
- Active
- Disused mine
- Coal deposit (some intermittently worked)
- Base metal deposit
- Gold deposit
- Industrial mineral deposit
- Coal deposit

EMD 2003
A substantial amount of information is available from two Divisions, both within the Department of Communications, Climate Action and Environment.

• **Exploration and Mining Division**  
The Exploration and Mining Division (EMD) deals with minerals policy, the administration of the State mining and prospecting system and minerals promotion. The Division comprises both administrative and technical staff, and is a key reference point with a full support service on all regulatory matters, including:

  • Legislative provisions  
  • Reference information on the geographical areas of all prospecting licences  
  • A quarterly publication on current ground holdings, or directly on an informal basis  
  • A contact for companies new to Ireland, or those interested in joint venture arrangements  
  • General reviews on various aspects of exploration and mining in Ireland  
  • Information on consultants and contractors based in Ireland  
  • Information on environmentally sensitive areas  
  • Exploration company reports released since 1 January 2000, in digital format  
  • Release of airborne geophysical surveys submitted by exploration companies  

• **Geological Survey of Ireland**  
The Geological Survey of Ireland (GSI) is a line Division of the Department of Communications, Climate Action and Environment, whose mandate is the provision of earth science information and advice. Relevant data sources include:

  • Paper geological maps at various scales.  
    1:100,000 scale maps with selected mineral localities described in associated reports.  
    1:25,000 and 1:10,560 scale ms maps with outcrop data. Smaller-scale mineral deposit and metallogenic maps of Ireland.  
  • Digital maps. Seamless geological map, based on 1:100,000 scale paper maps. All outcrops on 1:10,560 scale ms maps have been digitised.  
  • Mineral Exploration Open File. Assessment reports submitted by exploration companies under the terms of their Prospecting Licences and released upon surrender of the licence or six years after lodgement, whichever is the sooner.  
  • Mine Records. Drawings, plans and documents on historic and recent mines.  
  • Mineral Localities Database. Summary information for over 5,500 known mineral localities.  
  • Regional Geochemical Database. Multielement data in both map and digital formats for selected areas.  
  • Publications on selected mineral commodities in Ireland, and mineral locality data compilations.  
  • Drillcore. 180,000m of drill core is available for inspection in a modern core storage facility.  
  • Aeromagnetic data. 49,000 line km at a 1-2 km line spacing of regional aeromagnetic data (1979-1981), covering the central two-thirds of the country. Data is also available from two localised heliborne surveys (magnetic, frequency EM, radiometric).