

Industry News

March 2002

Development

Galmoy (Arcon Mines)

During 2001 **Arcon Mines Ltd.** milled 548,229t of ore grading 10.27% Zn and 0.57% Pb at their underground zinc-lead mine at Galmoy, Co. Kilkenny. This yielded 89,687t of zinc concentrate (52.7% Zn) and 563t of lead concentrate (37.6% Pb). Total production to end 2001 amounts to 2.5Mt of ore milled at 10.6% Zn and 0.69% Pb. Due to weak zinc prices, Arcon has reduced exploration in the area of the mine.

At the end of January 2002 there was a roof collapse in an open stope in a worked-out area of the mine. There were no injuries, and while work has ceased in the immediate area of the collapse, the impact on production from the incident has been minimal.

Lisheen (Anglo American-Ivernia West)

The underground zinc-lead Lisheen Mine in Co. Tipperary is a 50:50 joint venture between **Anglo American** and **Ivernia West**, and is operated by Anglo American. During 2001 the mine milled 1,145,553t of ore at 11.05% Zn and 2.08% Pb. This produced 105,342t of zinc metal and 16,903t of lead metal in concentrates.

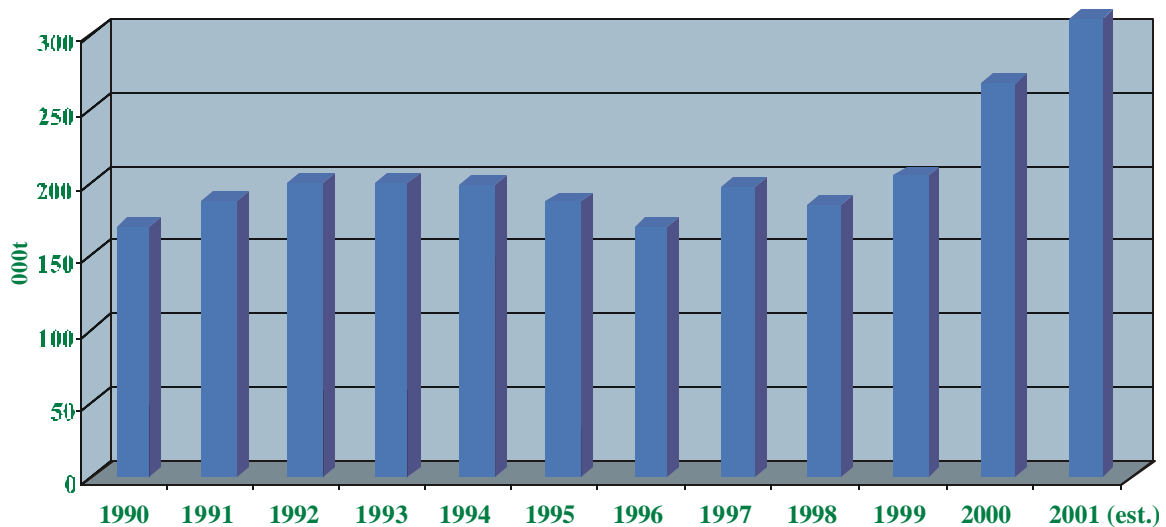
Mine production was interrupted in the third quarter of 2001 due to the intersection of poor ground in development headings. Ore access was delayed as a result of the remedial ground support activities. However, during the fourth quarter of 2001 production reached design levels of 1.5 million tonnes per annum, while November and December mine and mill production exceeded plan.

Navan (Outokumpo-Tara Mines)

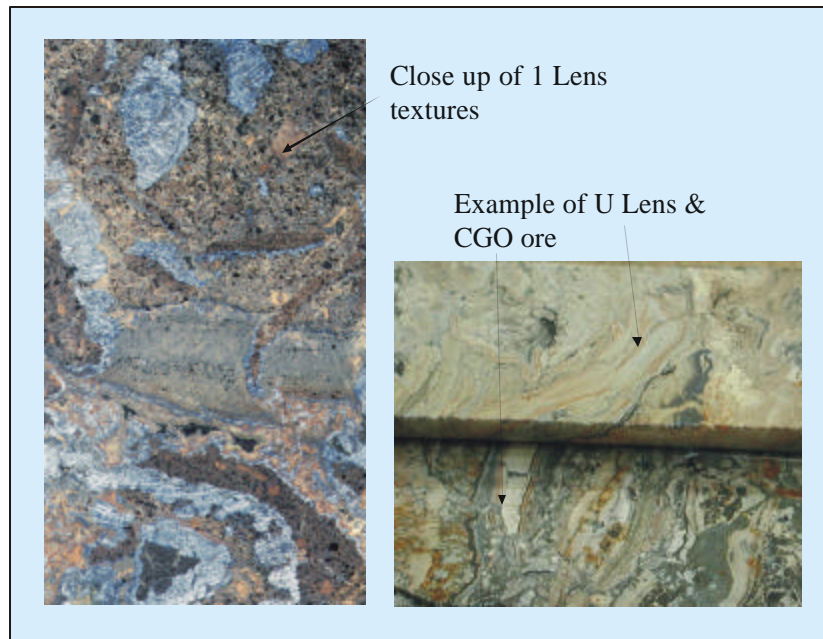
Production at the **Outokumpu-Tara Mines Ltd.** zinc-lead mine at Navan, Co. Meath during the first six months of 2001, the latest period for which figures are available, amounted to 1.13Mt at 8.46% Zn and 1.93% Pb. This yielded 160,466t of zinc concentrates (55.49% Zn) and 25,254t of lead concentrates (62.32% Pb). Total production to end June 2001 since mining commenced in 1977 is 53.56Mt grading 8.39% Zn and 2.07% Pb. At the end of 2000, Ore Reserves (Proved and Probable) were 12.1Mt grading 9.2% Zn and 2.2% Pb. Mineral Resources (Measured, Indicated and Inferred) totalled 16.7Mt grading 7.1% Zn and 2.2% Pb.

In May 2001, Tara Mines signed a contract with the receiver of **Bula Ltd** (in receivership) to purchase the assets of Bula for IR£27.5 million. The principal asset comprises a deposit containing a mineral resource of some eight million tonnes grading 10% Zn and 2% Pb which abuts the northern boundary of the Tara orebody. This deposit requires verification drilling.

The Navan mine is the largest zinc mine in Europe, employs some 700 people, and produces almost 200,000t of zinc in concentrate annually. In November 2001, Outokumpu-Tara Mines placed the underground mine on care and maintenance, “..due to low zinc price and high production costs.” The company stated that production would be restarted when price prospects for zinc had improved significantly. At end January 2002 the company had completed a comprehensive review of zinc market conditions and the company’s plans relating to Tara. Outokumpu concluded that the price of zinc would remain uncertain for the first half of 2002; however, due to mine closures, the zinc concentrate market is expected ultimately to improve. The review highlighted the need to improve the mine’s technical condition, including the immediate need to carry out additional mine development and maintenance work. This work would take approximately three months. However, the review also indicated that Tara has the potential to be a low-cost and long-term viable operation, especially with the completion of the South West Extension (SWEX) project and the acquisition of the Bula ore body. Given that the necessary improvements require a significant capital investment (€70-80 million, including the acquisition of the Bula ore body), a number of issues need to be brought to a satisfactory conclusion before a decision to re-start the mine will be taken. This process is to be completed by mid-March 2002. If the Outokumpu Board approve the proposals to re-open, pre-production would start immediately, leading to a resumption of full production in June 2002.



Histogram showing Ireland's annual zinc production (metal in concentrate), 1990 to 2001.



Massive sulphide ore textures from the Navan deposit; Close-up of 1 Lens texture (left), U Lens ore (top right) and Conglomerate Group Ore (bottom right). Courtesy Outokumpu-Tara Mines Ltd.

Exploration

General

Despite a number of significant adverse developments during the past twelve months, exploration has continued at a reasonably satisfactory but reduced level, with a number of drilling programmes completed. Concern over the introduction of animal disease from the UK in March 2001 affected ground geophysics and geochemistry programmes, although diamond drilling continued, subject to strict protocols which the exploration and drilling companies implemented to a high standard. These concerns abated by late summer, and normal exploration activity has resumed. Also, the pattern of ground-holding and joint venture programmes have been altered, firstly by the take-over of **Rio Algom** by **Billiton**, and then by the merger of **Billiton** and **BHP**. All three companies have interests in Ireland (most significantly Rio Algom), and it is not yet clear how these corporate developments will impact on Ireland. In addition, the withdrawal of financially troubled **Pasminco** from exploration worldwide has resulted in the departure of the Australian company from Ireland. The temporary closure of the Navan mine has also meant the suspension of **Tara Mines'** exploration activity.

Company Activities

Anglo American Plc, through its wholly owned subsidiary **Amcorp (Ireland) Ltd**, are actively exploring in Ireland for base metal deposits. Amcorp currently hold exploration

licences in the North Cork, Cahir, Slieve Dart and the Curlew Mountains areas, and are in farm-in agreements with **Ovoca Resources plc**, **Westland Exploration Limited/Minco Ireland Limited** and **Mineral Estates Ireland Limited** in their respective Cahir/Slieve Dart, Moate and Loughshinny exploration blocks.

Angus and Ross hold a block of eight PLs on the margin of the Leinster Granite in Cos Carlow and Wexford. The block is centred on an extensive zone of lithium mineralization with significant associated tantalum values. Satellite studies and first-stage geochemical sampling have been completed. Consultancy Group CSA has concluded that further work could establish drill targets for potentially economic tantalum mineralization.

Arcon Exploration Plc carry out exploration on 19 prospecting licence areas. Nine of these, including a licence in which Arcon is in joint venture with **Westland Ltd** (a subsidiary of **Ennex International**), comprise a contiguous block around the Galmoy Mine. The other licences are: two in Co. Longford along strike from the Keel deposit; four licences in Co. Offaly, two of which cover the highly prospective Navan/Silvermines corridor and two cover the Ferbane inlier; two licences in Co. Kildare which cover the Harberton Bridge zinc/lead prospect; and two licences in Co. Limerick, one of which is in joint venture with Noranda and includes the Carrickittle zinc/lead prospect and is also adjacent to the newly discovered Noranda/Minco Pallas Green Prospect.

During last year Arcon concentrated their exploration efforts on their Rapla Prospect which lies c. 5km northeast of Galmoy Mine and which straddles the boundary between Westland's PL 1653, now the subject of a joint venture with Arcon, and PL 3312, 100% held by Arcon. Further resource-grade mineralization has been intersected by drilling in PL 3312, and an extensive but detailed gravity survey has revealed a fault pattern linking Rapla with the G Fault at Galmoy, opening up a very large area of potential.

Asarco Incorporated, a wholly owned subsidiary of **Grupo Mexico**, currently holds 9 licences in Cos Kildare, Offaly and Laois. The company is presently drilling as part of their continued exploration programme for the Kildare area, following up on promising results from the 2000 drilling programme. Asarco continues to target the area to the west and northwest of the Kildare/Harberton Bridge mineralization, and has successfully located new areas of mineralization there which indicate much unexplored potential.

Cambridge Mineral Resources Plc (Cambridge) is exploring for diamond and gemstone deposits within a block of ten Prospecting Licences on the Inishowen Peninsula in Co. Donegal. Stream sediment sampling has yielded a number of diamond indicator minerals and abundant rubies and sapphires. Based on deep seismic reflection studies, Archaean lithospheric mantle is interpreted to lie over 40km beneath the Inishowen region.

Exploration by Cambridge has included high-resolution aeromagnetic surveying of the entire licence block, ground magnetic surveys, prospecting and mapping; it has also included 300m of NQ drilling in five separate holes, and 260m of trenching. Bulk stream sediment samples were processed in the on-site laboratory by Wilfley Table, and dispatched for analysis in Canada.

Based on diamond indicator evidence, the target diamond host rock for Inishowen is lamproite. Furthermore, a potential minette or lamprophyre (camptonite) pipe, two camptonite dykes and an altered minette dyke have been discovered by Cambridge at investigated sites. These lithologies include lithologies similar to ruby- and sapphire-bearing rocks in gemstone mining areas in New South Wales, Thailand and Cambodia. Cambridge are looking for a joint venture partner for this project.

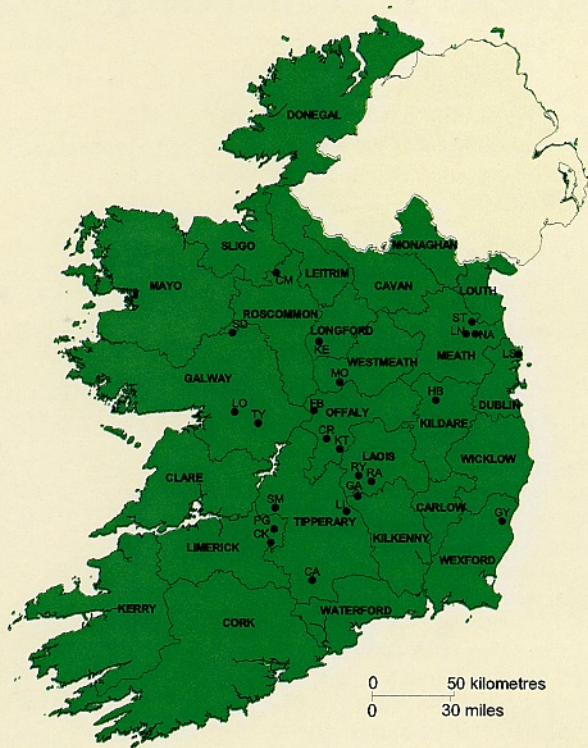
Claddagh Gold hold a block of three licences near Loughrea, in southeast Co. Galway. The company are interested in base metals, and will resume a drilling programme on the property this summer.

Conroy Diamonds and Gold Plc's exploration strategy is focused on the Longford – Down Massif, and in particular on gold and base metal mineralization associated with a major regional structure known as the Orlock Bridge Fault. The Company's ground-holding comprises a contiguous block of 27 prospecting licences, covering an area of over 1,000 km², in Counties Monaghan and Cavan. The Company also holds adjacent acreage in Co. Armagh in Northern Ireland. An extensive gold bearing system extending for approximately 20 km from Co. Armagh into Co. Monaghan has been identified. Two gold prospects have been demonstrated by drilling. Work at one of these prospects (Tullybuck–Lisglassan in Co. Monaghan) recently formed part of a research project by an independent European research team led by the British Geological Survey. Their findings confirm that gold mineralization at this prospect is more extensive than previously believed. A series of further drilling and trenching targets have been defined both within the Armagh–Monaghan Gold Belt and elsewhere in the Longford–Down Massif.

Glencar Mining Plc hold 2 prospecting licences in Co. Laois along the projected northeasterly extension of the Rathdowney Trend. During 2001 the first deep borehole on the property to date was completed. This intersected an extensive deep dolomitised faulted zone between 870m and 970m vertical depth, with associated weakly anomalous zinc mineralization. The company believes that a sizeable drilling programme is warranted on the property, and is looking for a joint venture partner to bring the project forward.

Classified Mineral Resource estimates on Glencar's Navan property, PL 1496, remained unchanged during the year. At Liscarton, the Glencar portion of the main Tara orebody has a Measured Mineral Resource of 1.2 million tonnes at 8.4% Zn, 2% Pb. The PL 1496 portion of the Scallanstown-Tatestown deposit, which is a satellite of the Tara orebody, has a Measured Mineral Resource of 250,000 tonnes at 6.17% Zn, 4.18% Pb. A joint venture partner is being sought for this project.

Hereward Ventures Plc (Hereward) is exploring for zinc within eight prospecting licences that form a contiguous block, the Tullamore Licence Block, 80km west of Dublin. The Block lies close to the Kinnitty and Crinkill prospects and, in the northwest, contains a major regional structure, the Knockshigowna Fault. The presence of Chadian volcanic rocks demonstrates that structures present penetrated to deep crustal levels and



- CAHIR (CA)
- CARRICKITTE (CK)
- CURLEW MOUNTAINS (CM)
- CRINKILL (CR)
- FERBANE (FB)
- GALMOY (GA)
- GOREY (GY)
- HARBERTON BRIDGE (HB)
- KEEL (KE)
- KINNITTY (KT)
- LISHEEN (LI)
- LISCARTON (LN)
- LOUGHREA (LO)
- LOUGHSHINNY (LS)
- MOATE (MO)
- NAVAN (NA)
- PALAS GREEN (PG)
- RAPLA (RA)
- RATHDOWNEY (RY)
- SLIEVE DART (SD)
- SILVERMINES (SM)
- SCANLLANSTOWN-TATESTOWN (ST)
- TULLYBUCK-LISGLASSAN (TL)
- TYNAGH (TY)

0 ——— 50 kilometres
 0 ——— 30 miles

Map showing localities mentioned in the text.

were active in the Chadian. The Knockshigowna Fault and associated faults are interpreted to have been controls for mineralizing processes. Waulsortian lithologies, one of the main hosts for Zn-Pb mineralization in Ireland, are interpreted to be present within all of the licences, either in outcrop or at depth.

Work undertaken by Hereward includes high-resolution airborne magnetic surveying, data compilation and geological interpretation. Hereward's aeromagnetic data was re-processed by independent geophysicists. Upward continuation processing was undertaken, using a technique modified from CSIRO-developed wavelet processing. This state-of-the-art procedure has delineated a number of discrete target structures for drill testing. Hereward are seeking a joint venture partner for this property.

Minco holds directly, or indirectly through joint venture, varying interests from 100% to 5% in seven project areas for zinc/lead and gold. The project areas comprise 39 prospecting licences, making the company one of the largest holders of prospecting licences in the country. In 2001, five of the properties were operated in joint venture with major international mining companies.

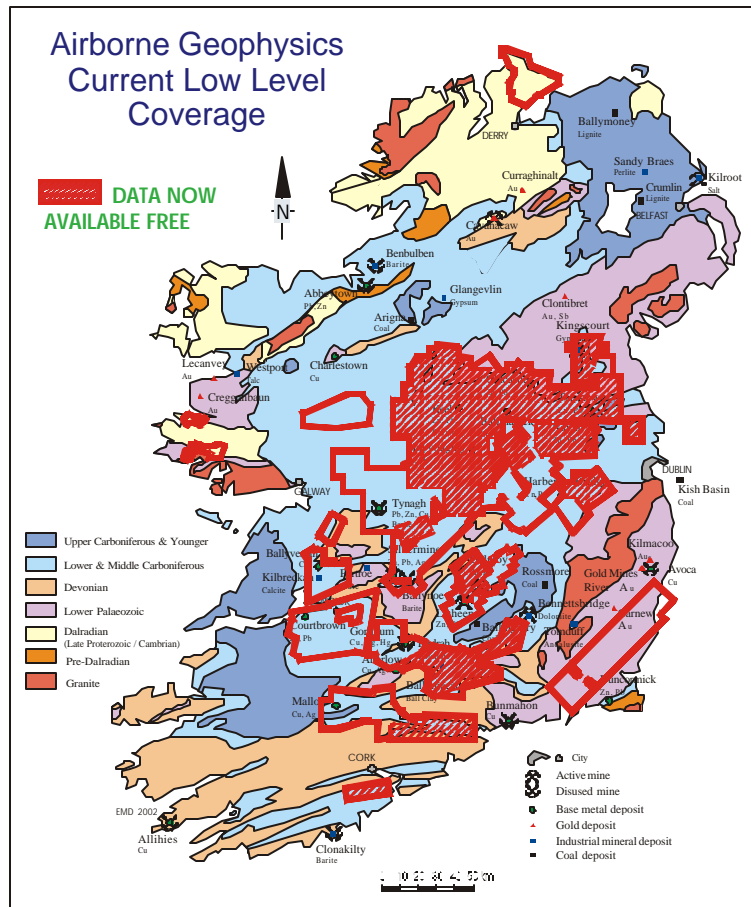
Minco have stated that the past year was one of great encouragement. The Pallas Green property in County Limerick has developed, they believe, into one of the most exciting mineral exploration prospects in Ireland. Two high-grade lenses of mineralization have been discovered at Castlegarde which, although small, "... are probably the best mineral exploration results achieved in Ireland since the discovery of the Lisheen mine in 1990. The Pallas Green area is now generally accepted by the industry as the most prospective place in the country for zinc mineralization. In the past year, 48 holes were completed on the property for a total of 10,877m of drilling".

In addition to the massive sulphide lenses, an area of lower grade but widely disseminated mineralization was discovered at Gortnagarde about 2km to the northwest. These new discoveries are in addition to the discovery made at Shrane, about 12km further to the west.

Minco hold the view that the mineralization in the Castlegarde lenses is essentially identical to that seen at the Lisheen and Galmoy mines. The larger lens is similar in orientation and outline to the Galmoy K-Zone, which is a small lens peripheral to the principal deposits at the mine. Minco believe that the Castlegarde lenses are potentially peripheral to a considerably larger ore body or ore bodies.

Drilling along strike to the west of Castlegarde (at Gortnagarde), sited to test geophysical anomalies, intersected wide sections of breccia containing low grade zinc and pyrite mineralization. According to Minco, these appear comparable to the breccias seen at Lisheen, Galmoy and Silvermines, which host the economic massive sulphide lenses. Four additional prospecting licences were added to the property during the year, following the discovery of several new areas of high-grade zinc mineralization along the Pallas Green Trend.

During the past year, Minco's major joint venture partners included **Noranda** (Canada), **Billiton** (UK), **Arcon** and **Ennex International**. During the year, the company entered into a new joint venture agreement with **Anglo American** (South Africa) on the Moate property which was previously joint ventured to **Rio Algom**. Expenditure by joint venture partners in 2001 amounted to approximately US\$750,000. Minco also holds interests in five Prospecting Licences where the focus is for vein gold and shear-hosted gold mineralization. Two licences are in the Inishowen area of Co. Donegal (see Merville Minerals) and three are located at the Co. Wicklow/Wexford border, near Gorey. Several significant targets remain to be drill tested on both blocks.



Current coverage and availability of low-level airborne geophysical surveys

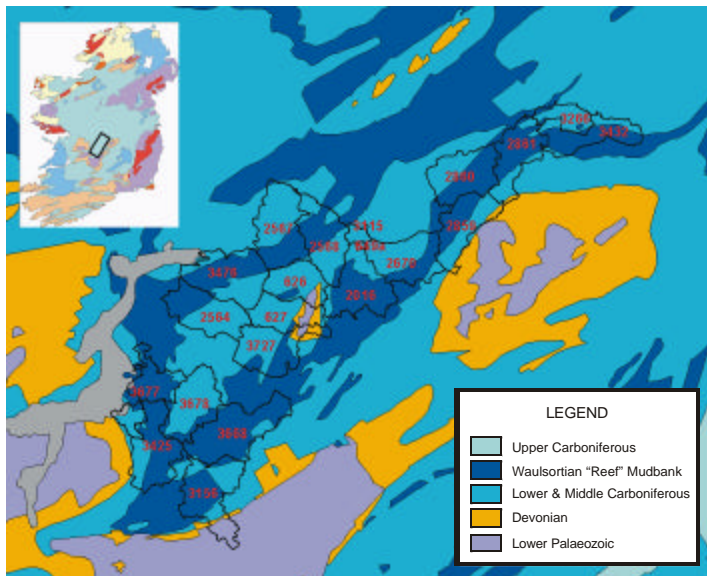
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Merville Minerals hold two prospecting licences in Donegal where previous exploration located quartz vein boulders forming a compact field measuring 200m by 500 m and assaying up to 60 g/t Au. The prospect is considered to hold potential for an economic vein or stockwork gold deposit hosted by Dalradian metasediments. Evidence for more widespread gold mineralization is provided by numerous gold drainage anomalies and isolated float boulders throughout the license area. **Minco** hold an interest in these two licences.

Merville also holds two prospecting licences in County Wicklow, centred on a number of tantalum-bearing pegmatite bodies. Preliminary sampling by Merville has returned values of up to 398ppm Ta in pegmatite boulders. Previous drilling for lithium is reported to

have intersected values of up to 1300 ppm Ta over 1m width. Merville is seeking joint-venture partners for its properties in Donegal and Wicklow.

Navan Resources Plc are maintaining their interest in base metal exploration in Ireland through a farm-in agreement on their licences with **Tara Mines**. The properties are mainly in the west and north-central Midlands, with the programme funded by Tara and operated by Navan. Tara recently achieved a 51% share in these properties. Exploration activities to date have included diamond drilling, airborne magnetics and geochemical sampling. Drilling in the Tynagh block has confirmed the existence of a prominent structure that had been inferred from the aeromagnetic survey, and has intersected weak zinc mineralization in carbonates adjacent to the main fault zone.



Map showing location of blocks of Prospecting Licences for which exploration data has been released to date under the Exploration Data Release Initiative 2002.

Tara Mines Ltd has continued to explore extensively in Ireland for new base metal deposits. As of January 2002 Tara either operated or funded exploration on over 90 prospecting licences, carrying out grassroots as well as more detailed near-mine exploration. Successful exploration results during 2001 around Tara Mines southwest extension (SWEX) have resulted in the discovery of a further 1.9Mt of resources grading 10.2% Zn+Pb.

Potential for further discoveries remains good, highlighted by a 19.6m intersection grading 19% Zn in a step-out hole during the final quarter of 2001.

Regional exploration is principally focused on carbonate-hosted base metals and has produced encouraging results particularly in Limerick where an intersection of 2.1m grading 25% Zn was encountered. In Galway promising results came from the Tynagh area, where Tara have recently earned a 51% holding in prospecting licences held by **Navan Resources Plc**. In Wexford, where the target is VHMS deposits within the Ordovician volcanics, ground follow-up of earlier airborne EM has identified a number of conductive targets that required drill testing.

Tara is also involved in a joint venture with **Westland (Ennex International)** on the Tatestown prospect 3km NW of Navan and hold a 36% interest in **Oretec Resources Plc**.

Airborne Geophysical Surveys

During 2001 two low-level airborne geophysical surveys were carried out, one in Cahir, Co. Tipperary, and the other over Slieve Dart, NE Galway. Both surveys were over prospective Lower Carboniferous terrain, and were carried out by **Amcorp**.

Prospecting Licence Information

During 2001, 36 new Prospecting Licences (PLs) were issued, while over the same period 119 licences were surrendered; the number of licences currently held is 397. Of the surrendered licences, **Boliden** surrendered 38 PLs, while **Pasminco** surrendered 11. Both of these developments were the result of corporate decisions by the companies to withdraw globally from exploration.

Amcorp were awarded 16 licences; 12 of these are in Cos Roscommon and Galway, adjoining or close to a block of six licences held by **Ovoca Resources**, where Amcorp have a joint venture agreement. The other four licences are in Cos Tipperary and Waterford, and adjoin the Cahir block of eight PLs held by **Ovoca Resources**, which are also in joint venture with Amcorp. Four PLs were issued to **Noranda/Minco** in Cos Limerick, Clare and Tipperary; all adjoin the block of licences that includes the Pallas Green prospect. In addition, Noranda received a licence in Co. Offaly. **Tara Mines** were issued with one licence in Co. Meath, west of the Navan property. **Navan Resources** were awarded four licences in east Co. Galway, adjoining ground already held by the company. **Asarco Exploration** were granted two licences in Co. Kildare. **Ivernia West/Anglo American (Amcorp)** received two PLs in Co. Laois, while **Ivernia West/Rio Algom (now BHP Billiton)** received a PL in Co. Westmeath. **Anglo Exploration (also Amcorp)** were granted a PL in Co. Cork. All of these 32 licences were issued for base metals, barytes and silver. **Tara Mines** received a PL in Co. Wexford that also included gold, while **Billiton** received a PL in Co. Clare that also included gold, calcite and fluorite. Finally, **Moville Minerals** received two licences in Co. Wicklow for tantalum, tin, niobium, lithium and caesium.

New Initiatives

The Exploration and Mining Division (EMD) has embarked on three significant complementary new Initiatives since June 2001, to encourage exploration investment and stimulate interest. The common theme is to provide, **free of charge and in digital format**, all non confidential data that is available through the Division.

Airborne Data Release Initiative 2001. Since 1995 low level high resolution geophysical surveys have been flown over 57 areas by various companies under the EMD 'open skies' policy. Some 30% of the country, largely prospective Lower Carboniferous terrain, has been covered. All data is lodged with EMD, and once the 4 year confidentiality period has expired is being made progressively available to the public. The first survey was released in June 2001, and to date

over 50% of the coverage has been made available **free** (see Figure) on CD. Each release includes digital databases, grids and maps. Additional maps generated by EMD are also included.

Exploration Data Release Initiative 2002. Until now the only available company exploration data was from exploration ground that had been surrendered. Under this Initiative all data over six years old from currently held Prospecting Licences areas will also now be released, providing a wealth of previously unavailable information **free of charge**. The initial phase is focused on long held areas that comprise a third of the current acreage, with the first block released in February (see Figure). All reports, drill logs and maps are in digital format. Data from areas surrendered since 1 January 2000 is also being made available digitally in a similar manner.

The MAPS Initiative. The MAPS (Minerals Administration Programme Support) Initiative is an ambitious major project designed to provide industry globally with all the needed information and available background data to assess ground and handle the business requirements of exploration and mining permitting through the internet. Started in December 2001, it is intended to go 'live' before September 2002. The key elements of the Initiative are streamlining internal processes and automated regulatory procedures leading to quicker permitting, e-Enabled business, **free** web access to all the data being released under the other two Initiatives, and all geographically based data (licence areas, base maps, environmentally restricted areas, forestry coverage, basic geology, airborne and ground exploration maps etc) in GIS format. As such the Initiative is intended to place Ireland at the forefront internationally in terms of offering maximum ease of access to full information availability and business transactions. Watch our website at www.emd.ie for status updates, or attend one of our future demonstrations!

Silvermines Historic Mining District, Co. Tipperary

In June 2000 the Department of Agriculture, Food and Rural Development published a report by a Government Inter Agency Group, which included the Department of the Marine and Natural Resources, on the influence of lead on human and animal health in the historic mining district of Silvermines, Co. Tipperary. The report found that management of all the mine sites in the area was unsatisfactory. The Minister for the Marine and Natural Resources undertook to provide costed management and/or rehabilitation plans for the district. Consultants were appointed and the plans will be published on April 9th 2002 and will be available on the Department's website, www.marine.gov.ie. The report was delayed due to the national access restrictions earlier in the year and the need for additional sampling.

Web-site

The Department of the Marine and Natural Resources web-site, www.marine.gov.ie has recently been updated, and now includes useful information on the Exploration and Mining Division. The Exploration and Mining Division also has its own IP address at www.emd.ie. We invite you to visit the site and to let us know how we can be of further help to you. As outlined above, our recent Initiatives will result in substantial improvements over the next six months.

Expenditure on Exploration and Mining

During 2000 expenditure on mineral exploration and development totalled Can\$15.63 million, an increase of 11% over 1999 (Can\$14.02 million). However, this improvement was due to a significant increase in exploration work within State Mining Facilities. Within Prospecting Licence areas expenditure was slightly lower at Can\$11.80 million (Can\$12.83 million in 1999), and continued to be dominated by base metal exploration at Can\$11.08 million. The development costs of Can\$64.38 million were essentially related to base metal operations and dominated by costs at Lisheen, Co. Tipperary. Figures for 2001 are not yet available, but are expected to show a decrease on 2000.