DIATREME RESOURCES LIMITED

ASX:DRX

# Exploration Activities Report
# Quarter ended 31 March 2013

## Highlights

### HEAVY MINERAL SAND PROJECTS

**Cyclone Zircon Project:** Progress made on proposed road access route to Cyclone and metallurgical testwork continued.

**WA Eucla Basin Project: "**Serpentine" exploration tenement application secured adjacent to the Cyclone Deposit.

**Arckaringa Project:** Five exploration tenements granted.

### METALLIFEROUS PROJECTS

**Clermont Copper Project (QLD):** Finalisation of farm-in arrangement with Antofagasta Minerals and exploration drilling undertaken over the Rosevale Project.

**Gilbert River Project (QLD):** Historic data compilation for future field work.

### CORPORATE

**Capital raising:** Agreements to subscribe for placements totalling 34,000,000 ordinary fully paid shares at $0.025 per share to existing sophisticated shareholders were received.

Test drilling for shallow water supplies – Cyclone, 2012

Diatreme Resources is an Australian based diversified mineral explorer with significant projects in heavy mineral sands, copper, base metals and gold.

The Company owns the world class Cyclone Zircon Deposit in Western Australia, situated within the Eucla Basin province, along with extensive areas of underexplored ground prospective for heavy mineral sands.

The Board and senior personnel exhibit wide experience, ranging through the exploration and development phases of resource management.

Australian Securities Exchange
Codes: DRX and DRXO

Securities
Ordinary shares (DRX):
473,582,422
Listed 15c options (30/09/13)(DRXO):
88,650,035

Board of Directors
Executive:
Tony Fawdon - Chairman/CEO
David Hall - Operations
Non-executive:
George White
Andrew Tsang
William Wang
Neil McIntyre
Joint Company Secretaries:
Leni Stanley
Tuan Do

Key Projects:
- Cyclone Zircon Project
- Clermont Copper Project
- Anabama Copper Iron Project
- Gilbert River Base Metals Project

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# HEAVY MINERAL SAND PROJECTS

## EUCLA BASIN PROJECT (WA)

### Cyclone Zircon Project (WA)

A Level One environmental studies report on three road options for connecting the proposed Cyclone mine site to the Transcontinental Railway submitted to the Department of Environment and Conservation (DEC) is under assessment. This report is part of the process to determine an agreed access route of lowest potential impact. The preferred route will subsequently be studied in greater detail, both environmentally and culturally, prior to lodgement of an application for a Miscellaneous Licence that can be used for construction of the mine site access and haul road.

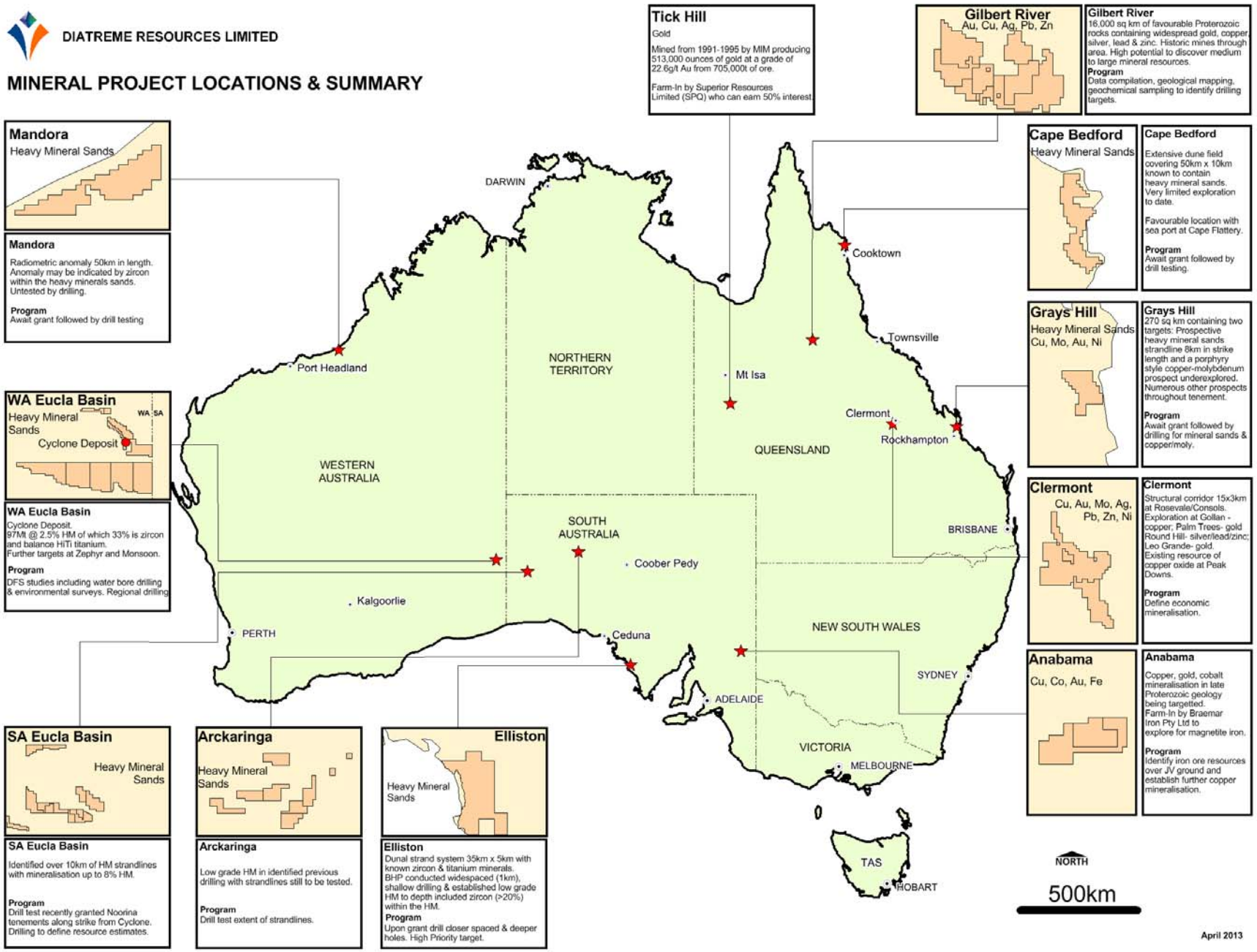
Discussions with the DEC and the Environment Protection Agency (EPA) have continued regarding road options from Cyclone to existing rail sidings on the Transcontinental railway. Diatreme has referred the project to the EPA for formal assessment under the Environmental Protection Act and the EPA has confirmed the level of assessment to be a Public Environmental Review. This is a significant step for the project as the recommended transport route in the Level One report is the route from Cyclone to Forrest. This route was has been reported as the route with least environmental and social impact and is the favoured route by the Company.

Alternative development models for the project are now being evaluated, including lower production rates and lower capital options, as part of ongoing discussions with potential project partners. Plans for testing the deep aquifers in the officer basin are essentially complete, ready for commencement of drilling when adequate funding is secured.

Metallurgical testwork by Mineral Technologies on a 12 tonne bulk sample representing the first two years of the planned operation at Cyclone has continued to make good progress on an extended schedule due to restricted funding. Metallurgical characterisation of four separate geological zones making up the sample was conducted before compositing the four zones for Wet Concentrator Plant (WCP) processing testwork. The WCP processing work has been completed and an interim report demonstrated similar valuable heavy mineral recovery to the March 2012 Prefeasibility Study.

The process circuit design for the WCP has been finalised. The heavy mineral concentrate (HMC) produced during the WCP testwork is currently undergoing MSP processing for optimisation of the process design, mineral recovery and final product quality. An improved method for assaying heavy mineral samples from Cyclone is being developed as part of the DFS metallurgical testwork program. Two additional bulk samples from areas with different mineral assemblages have been prepared for variability testing and finalisation of the flowsheet.

Transcontinental Railway (looking west) at Forrest, WA.
Rail siding is the proposed site for the trans-shipment of Cyclone heavy mineral product to seaport


DIATREME RESOURCES LIMITED
MINERAL PROJECT LOCATIONS & SUMMARY
Tick Hill
Gold
Mined from 1991-1995 by MIM producing 513,000 ounces of gold at a grade of 22.6g/t Au from 705,000t of ore.
Farm-In by Superior Resources Limited (SPQ) who can earn 50% interest.
Gilbert River
Au, Cu, Ag, Pb, Zn
Gilbert River
16,000 sq km of favourable Proterozoic rocks containing widespread gold, copper, silver, lead & zinc. Historic mines through area. High potential to discover medium to large mineral resources.
Program
Data compilation, geological mapping, geochemical sampling to identify drilling targets.
Mandora
Heavy Mineral Sands
Mandora
Radiometric anomaly 50km in length. Anomaly may be indicated by zircon within the heavy minerals sands. Untested by drilling.
Program
Await grant followed by drill testing
Cape Bedford
Heavy Mineral Sands
Cape Bedford
Extensive dune field covering 50km x 10km known to contain heavy mineral sands. Very limited exploration to date.
Favourable location with sea port at Cape Flattery.
Program
Await grant followed by drill testing.
DARWIN
Cooktown
Townsville
Port Headland
NORTHERN TERRITORY
Mt Isa
Clermont
Rockhampton
QUEENSLAND
WESTERN AUSTRALIA
SOUTH AUSTRALIA
Coober Pedy
BRISBANE
Kalgoorlie
PERTH
Ceduna
NEW SOUTH WALES
SYDNEY
ADELAIDE
VICTORIA
MELBOURNE
TAS
HOBART
WA Eucla Basin
Heavy Mineral Sands
Cyclone Deposit
WA
SA
WA Eucla Basin
Cyclone Deposit.
97Mt @ 2.5% HM of which 33% is zircon and balance HiTi titanium.
Further targets at Zephyr and Monsoon.
Program
DFS studies including water bore drilling & environmental surveys. Regional drilling
Grays Hill
Heavy Mineral Sands
Cu, Mo, Au, Ni
Grays Hill
270 sq km containing two targets: Prospective heavy mineral sands strandline 8km in strike length and a porphyry style copper-molybdenum prospect underexplored. Numerous other prospects throughout tenement.
Program
Await grant followed by drilling for mineral sands & copper/moly.
Clermont
Cu, Au, Mo, Ag, Pb, Zn, Ni
Clermont
Structural corridor 15x3km at Rosevale/Consols. Exploration at Gollan - copper; Palm Trees- gold Round Hill- silver/lead/zinc; Leo Grande- gold. Existing resource of copper oxide at Peak Downs.
Program
Define economic mineralisation.
Anabama
Cu, Co, Au, Fe
Anabama
Copper, gold, cobalt mineralisation in late Proterozoic geology being targetted. Farm-In by Braemar Iron Pty Ltd to explore for magnetite iron.
Program
Identify iron ore resources over JV ground and establish further copper mineralisation.
SA Eucla Basin
Heavy Mineral Sands
SA Eucla Basin
Identified over 10km of HM strandlines with mineralisation up to 8% HM.
Program
Drill test recently granted Noorina tenements along strike from Cyclone. Drilling to define resource estimates.
Arckaringa
Heavy Mineral Sands
Arckaringa
Low grade HM in identified previous drilling with strandlines still to be tested.
Program
Drill test extent of strandlines.
Elliston
Heavy Mineral Sands
Elliston
Dunal strand system 35km x 5km with known zircon & titanium minerals. BHP conducted widespaced (1km), shallow drilling & established low grade HM to depth included zircon (>20%) within the HM.
Program
Upon grant drill closer spaced & deeper holes. High Priority target.
NORTH
500km
April 2013

Regional Exploration

In early 2013, Exploration Licence Application E69/3113 hosting a number of strandline zones, was applied for over 292km$^2$ of land south-east of Cyclone (see Figure 1). The area trends along the Barton shoreline which hosts the Cyclone Deposit.

Although successfully explored in recent years for heavy mineral sands by a third party, an internal review indicated that the area retains significant exploration potential for the discovery of further heavy mineral mineralisation. A number of untested targets are open to drill testing and thus may result in future satellite deposits to support any mining operations that develop over Cyclone. The application area includes the zircon rich "Monsoon" mineralisation zone discovered by Image Resources NL late in 2008. The Monsoon zone is approximately 800m wide and remains open to both the north and south.

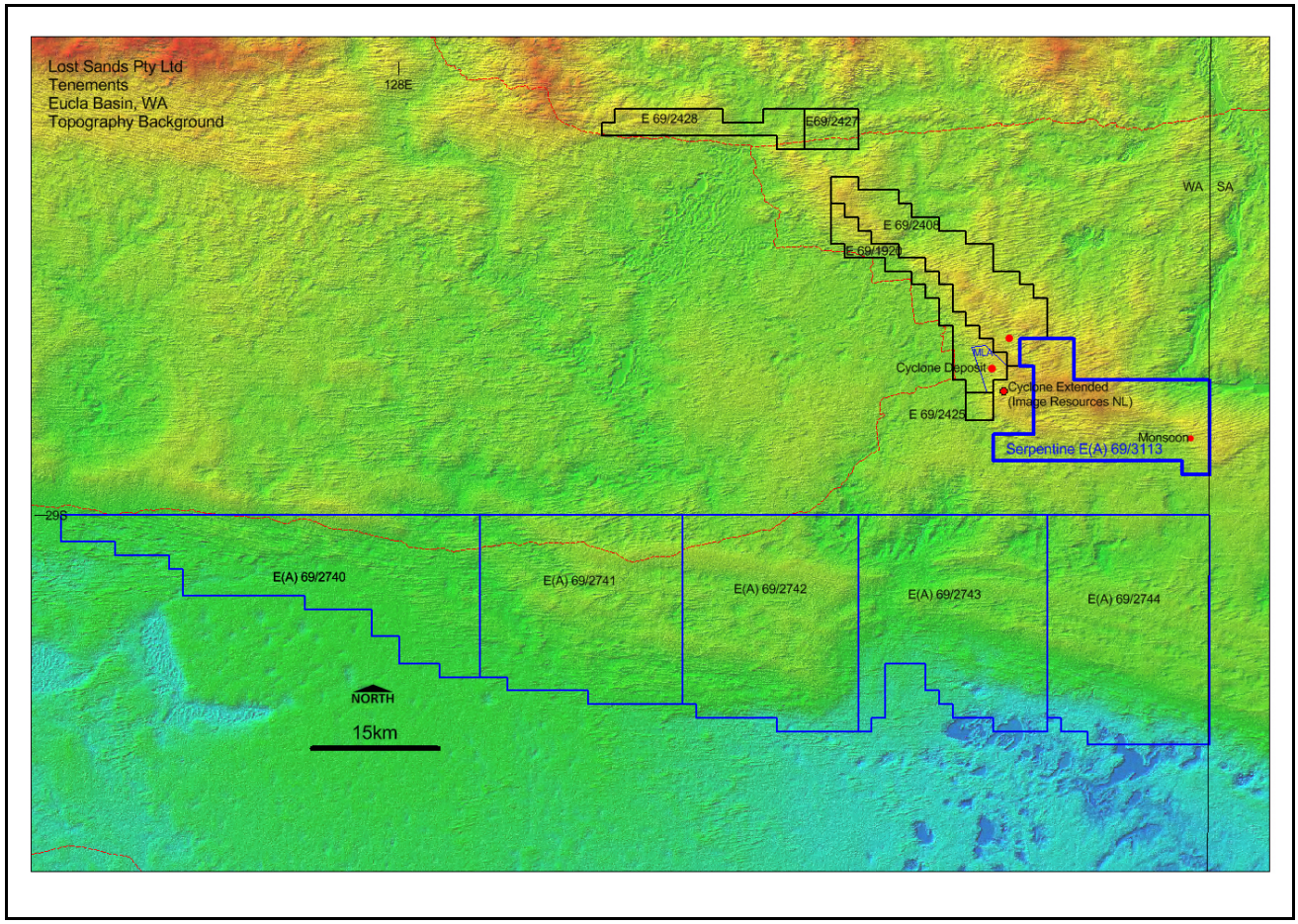



Figure 1: Eucla Basin Project (WA) exploration licences and applications showing the location of E69/3113 Serpentine, southeast of Cyclone Deposit.

## ARCKARINGA PROJECT (SA)

Five tenements were granted to Diatreme in January 2013 covering an area of 4,284km$^2$ within the Arckaringa Basin, 300km to the east of the Cyclone Deposit. Diatreme has used interpreted digital elevation model (topographic) data along with limited drilling within the area to determine regional targets outside known depositional basins to define potential concentrations of heavy minerals. A program of stratigraphic drilling is planned along existing seismic lines and roads to further assess this area.

# METALLIFEROUS PROJECTS

## CLERMONT COPPER GOLD PROJECT (QLD) - FARM-IN BY ANTOFAGASTA MINERALS AUSTRALIA

Drilling commenced in January on the Rosevale Project with the aim of locating large copper porphyry deposits. During January, drilling was completed on the Rosevale Project with two reverse circulation (RC) holes at the Red Dog Prospect and three RC holes at the Elektra Prospect. An additional RC hole was drilled between Round Hill and West Copperfield to bring the total RC drilling to 810m. Diamond drilling commenced on the 30th January and concluded on the 28th February all at the Gollan Prospect within the Rosevale Project.

ROSEVALE PROJECT - DRILLING SUMMARY

| Collar ID | Easting | Northing | RL | Final Depth | Surface Azimuth (mag) | Surface Dip | Date Start | Date Finish |
|---|---|---|---|---|---|---|---|---|
| RDRC-007 | 551995 | 7471970 | 300 | 156 | 211 | 60 | 19/01/2013 | 19/01/2013 |
| RDRC-008 | 552005 | 7471983 | 301 | 174 | 031 | 60 | 20/01/2013 | 20/01/2013 |
| ERC-001 | 550698 | 7471429 | 320 | 150 | 075 | 60 | 21/01/2013 | 21/01/2013 |
| ERC-002 | 550859 | 7471504 | 320 | 150 | 075 | 60 | 21/01/2013 | 22/01/2013 |
| ERC-003 | 550928 | 7471537 | 320 | 102 | 243 | 60 | 22/01/2013 | 22/01/2013 |
| RHRC-001 | 550814 | 7472654 | 332 | 78 | 055 | 55 | 23/01/2013 | 23/01/2013 |
| RDD-015 | 549989 | 7472867 | 325 | 663.7 | 057 | 70 | 30/01/2013 | 11/02/2013 |
| RDD-016 | 550531 | 7472602 | 325 | 576.7 | 221 | 80 | 12/02/2013 | 21/02/2013 |
| RDD-017 | 550531 | 7472602 | 325 | 300 | 044 | 55 | 22/02/2013 | 28/02/2013 |

REVERSE CIRCULATION DRILLING

RED DOG PROSPECT

RDRC-007

Drill hole RDRC-007 completed to 156m. Dominant lithology is variably magnetic quartz mica schist. No mineralisation, other than that seen commonly in the schist due to metamorphism, was encountered, although epidote-haematite alteration was noted in the upper 2/3rds of hole with generally high magnetic susceptibility, both of which diminished and cut out down hole.

RDRC-008

RDRC-008 was completed to 174m.The hole was collared in schist and after crossing an inferred fault between 52m and 55m entered finely porphyritic dacite which persisted for 2m before the hole entered massive, featureless rhyolite at 58m. The hole passed back into schist at 144m and was continued to 174m as pyrite was encountered in the schist.

RC drilling in progress – Red Dog Prospect

## ELEKTRA PROSPECT

Drilling at Elektra has been completed with ERC-001 drilled to 150m across the zone of fracture-hosted malachite in the area of the old exploration pits, ERC-002 to 150m towards the mapped body of diorite and ERC-003 to 102m from the east towards the dioritic body. All holes were collared in the coarse quartz monzonite.

ERC-001 showed consistent traces of pyrite and less common chalcopyrite mineralisation in the chips, thus confirming observations at the surface that this is a zone of mineralisation. The mineralisation at the surface is fracture hosted, and results from this and the other Elektra holes suggest that indeed the mineralisation is confined to this faulted zone and extends as part of a fault system, via Hillview, to the Consols-Savannah region, 8km to the southeast.

ERC-002 demonstrated that the diorite body mapped by surface float and subcrop is a narrow, unmineralised dyke. The hole was drilled from the northeast to the southwest as a scissor hole of ERC-003.

The three ERC holes have demonstrated that mineralisation at Elektra is confined to the Elektra fault zone, which has an estimated width of around 80m of faulted, veined and otherwise fractured rock. Results from this drilling end the supposition that Elektra might be a bulk mineralised target. However, a source for the fault-controlled copper mineralisation at Elektra, as with Hillview and the other prospects, is still to be found. More mapping and drilling is required.

## ROUND HILL – WEST COPPERFIELD IP ANOMALY

One drill hole (RHRC-001) was drilled to the northeast of Round Hill towards the IP chargeability zone between Round Hill and West Copperfield to test the local bedrock, thought possibly to be fine monzonite and to attempt to assess the reason for the chargeability high.

RHRC-001 encountered doleritic bedrock from surface to the end of hole at 78m. The upper part of the hole was marked by variable degrees of haematite alteration of plagioclases and related epidote vein material. At 46m depth there occurred a slight colour change in the dolerite, with calcite veining and very fine veinlets of chalcopyrite and pyrite being encountered. Dolerite continued below this probable fault zone and in contrast to the rocks above, little to no haematite alteration and epidote veining was encountered.

This hole is of value in revising the local geological map and more so in demonstrating the possibility of faults elevating deeper, more altered dolerite to near surface levels. The haematite-epidote alteration ("red-rock") alteration occurs, in the main, in the deeper parts of the original Gollan drill hole and therefore it may be surmised that the near-surface level of the haematite-epidote alteration in this hole could have been uplifted into its present position by faulting.

## GOLLAN PROSPECT - CORE DRILLING

Three diamond core drill holes were completed at the Gollan Prospect during the quarter for a total meterage of 1,540m.

RDD-015

Drilling commenced 30th January and finished 11th February concluding at total depth of 663.7m. Visible gold is observed at 237m in a fracture with haematite, fine quartz and chlorite. Trace chalcopyrite was observed between drill collar and 160m, 380-500m and 580m to end-of-hole (663.7m).

RDD-016

Drilling commenced 12th February and finished 21st February concluding at total depth of 576.7m. Trace chalcopyrite occurs in the top 120m together with traces of chalcopyrite in the last 80m (500-576.7m)

RDD-017

The drilling budget allowed for an unplanned third diamond core hole (RDD-017) to a depth of 300m. The lower half of this hole intersected frequent low-grade chalcopyrite with considerable pyrite.

All three holes were collared in a Siluro-Devonian dolerite and remained in dolerite for their entire lengths, except where interrupted by rare, narrow, dykes of rhyolite and more rare dacite. Very minor microdykes of a pink granite were found in all core and these, whilst insignificant volumetrically, are significant in that some carried chalcopyrite, indicating potentially a granitic source for copper mineralisation, thus matching outcrop observations in the northern and northeastern parts of the Gollan and Red Dog prospects.

Chalcopyrite mineralisation was noted in all holes, though only generally minor in abundance. Chalcopyrite generally occurs as intergranular grains in the dolerite, as small clusters in the very rare quartz veins and within the granitic microdykes.

Further drilling is required in the Gollan area to define the source of the alteration and the copper mineralisation which is widespread throughout this region.

## GILBERT RIVER BASE METALS PROJECT (QLD)

During the quarter, significant progress was made compiling all regional data sets of historic exploration covering the Gilbert River project area and incorporating it into a workable GIS (geographic information system). This has enabled a prospect by prospect review incorporating all existing data whereby a field trip to ground truth all known areas of mineralisation and potential will be undertaken in Q2 2013. Following the prospect review, it is expected more detailed prospect mapping and sampling will be undertaken on specific targets generated from the GIS and Q2 field program.

## TICK HILL GOLD PROJECT (QLD) – FARM-IN BY SUPERIOR RESOURCES LIMITED

Progress was made towards satisfying the preconditions for the agreement with Superior Resources Limited (SPQ). Advertising of an application for an Environmental Licence Level 1, required by the Queensland government prior to their approving the transfer of the three mining leases to the Company, was completed.

# CORPORATE

On 15 March 2013, the Company announced that it had secured signed placement agreements to subscribe for 34,000,000 ordinary fully paid shares at $0.025 per share from existing sophisticated shareholders. Funds raised will be applied to the Company's project activities and for working capital.

On 25 March 2013, the Company released its annual financial report for the year ended 31 December 2013.

Dated 30 April 2013

Anthony J Fawdon
Executive Chairman/CEO

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Competent Person Statements

The information in this report, insofar as it relates to Exploration Results and Mineral Resources is based on information compiled by company personnel under the supervision of Mr David Jelley, who is a full time employee of Diatreme Resources Limited and a Member of the Australasian Institute of Mining and Metallurgy. Mr Jelley has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he has undertaken to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Jelley consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.