

HIGHLIGHTS

EXPLORATION ACTIVITIES REPORT QUARTER ENDED 31 MARCH 2016

HIGHLIGHTS

- * **Final environmental approvals for Cyclone Zircon Project expected in April as project 'de-risking' nears completion**
- * **Maiden Mineral Resource and positive scoping study for tailings reprocessing boost prospects for near-term cashflow from Tick Hill Gold Project.**

CYCLONE ZIRCON PROJECT (WA)

Following a series of meeting and requests for additional supporting data, Diatreme has been advised by the OEPA that their draft assessment of the Cyclone Project PER will be formally presented at the EPA board meeting scheduled for 21 April 2016.

TICK HILL GOLD PROJECT (QLD)

A maiden mineral resource comprising 22,000 t oz of gold has been estimated for the Tick Hill tailings material, based on two programs of exploration drilling conducted by the company in the second half of 2015, and positive results from the first stage metallurgical tests completed in October 2015.

A scoping study completed by an independent external consultant demonstrated potential for a commercially viable operation to mine and process the tailings material, and provided recommendations for further work to advance the project. Work is now being planned to determine the optimal grind size to balance gold extraction and energy input, develop a detailed process flowsheet and confirm capital and operating cost estimates.

Diatreme Resources Limited is an Australian based diversified mineral explorer with significant projects in WA and QLD.

Key Projects:

- Cyclone Zircon Project
- Tick Hill Gold Project
- Cape Bedford Silica/HMS Project
- Clermont Copper Project

The Company seeks to develop the Cyclone Zircon Deposit in WA, through a joint venture arrangement, and conducts exploration over a number of project areas prospective for heavy mineral sands, silica sand, gold and copper.

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

Australian Securities Exchange
Codes: DRX, DRXO

Board of Directors - Non-executive:

William Wang - Chairman
Andrew Tsang
Daniel Zhuang

Executive:

Neil McIntyre – Chief Executive
Tuan Do – CFO & Co. Secretary
Ian Reudavey – Chief Geologist

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CYCLONE ZIRCON PROJECT (WA)

DRX personnel and consultants attended a meeting with the EPA on 17 December to present the current status of the project and provide additional information relevant to the public review. A detailed response providing the additional information that has been requested by the EPA was completed and submitted to the OEPA in January 2016.

As part of the approvals process DRX has been negotiating an offsets package for the proposed disturbance to the Great Victoria Desert Nature Reserve which will result from construction of the haul road from the Cyclone mine to the Forrest rail siding. A meeting to finalise this aspect of the PER report was held in Perth in late March 2016. DRX continues to provide additional project information as requested by the OEPA and other regulatory authorities during the environmental approval process.

The OEPA will assess the additional PER response for consideration by the EPA and a recommendation is expected to be finalised during March 2016. Completion of the PER process is expected to result in a positive recommendation to the Minister of Environment by the EPA for approval of the Cyclone Project. This recommendation will cover the mining operation, support services, and all infrastructure, including the haul road from Cyclone to the Forrest rail siding. The timing of these activities is expected to result in DRX receiving environmental approval for the Cyclone Project by April 2016.

In March, DRX appointed Sedgman Limited, a leading provider of mineral processing and associated infrastructure solutions to the mineral sands industry, to undertake a "Project Enhancement and Update Study" for the Cyclone Zircon Project. Sedgman will review work undertaken for the PFS and provide an updated assessment of all base project assumptions at a technical and commercial level, giving Diatreme a greater understanding of the project's potential commercial returns. Current industry and market conditions are expected to provide an opportunity for cost savings on key capital and operating expenditures.

TICK HILL GOLD PROJECT (QLD)

The Tick Hill Gold Project comprises three granted Mining Lease No's 7094, 7096 and 7097 (totaling 390ha). The Tick Hill Gold Deposit was mined between 1991 and 1995 by Carpentaria Gold Pty Ltd (a subsidiary of MIM Holdings Limited) for the production of 513,333 ounces of gold from 705,000 tonnes of ore at a recovered grade of 22.6 g/t gold (source: MIM – Annual Reports). This makes it one of the highest grade gold deposits in Australia's recent gold producing history.

The transfer of the three ML's to Diatreme Resources was confirmed by the Department in March 2015, triggering the commencement of the DRX Farm-In and Joint Venture Agreement with Superior Resources Limited (ASX:SPQ) over the Tick Hill Gold Project. Under the Joint Venture Agreement, Superior Resources has the right to earn a 50% interest in the project by:

- Completing \$750,000 of exploration expenditure;
- Making a payment to DRX of \$100,000; and
- Lodging 50% of the Queensland Government security bond on the tenements.

Exploration and assessment of the surface material within the leases (including alluvials, tailings and waste dumps) is to be conducted as a joint operation, with each party contributing 50% of the costs.

The Tick Hill Gold Mine operated from August 1991 through to March 1995, with commissioning of the site processing plant in December 1991. The plant comprised crushing and milling circuits delivering a product with a p80 of 70µm to a CIL circuit. Tailings were discharged into a tailings dam comprising two paddocks of a "turkeys nest" construction in which a perimeter embankment with a clay core retains tailings. Wall heights range from 6m to 10.5m. Since decommissioning the surface has been capped and both the surface and batters seeded, with good vegetation cover now present.

The total reported production for the Tick Hill Gold Mine was 705,000t at 22.6 g/t Au for 15,900kg Au at 97% gold recovery. Some high grade open pit ore was mined and transported to the Carpentaria Gold operations at Ravenswood to provide early cash flow to the project, this has been estimated at 20,000t based on the reported 19,000oz produced at Ravenswood in the 1991/1992 financial year (with head grades for that year of 30.2 g/t Au). This suggests that approximately 685,000t of tailings remain on site, with an estimated grade around 0.7 g/t Au.

The tailings dam is calculated to have an average weighted grade of **1.08 g/t Au** based on the combination of reconnaissance and infill drilling (including a top cut of 4.0 g/t Au). The combined weighted average grade for the eastern paddock is calculated at 1.42 g/t Au (74.1m at 1.42 g/t Au from reconnaissance drilling and 81.2m at 1.43 g/t Au from infill drilling) and the combined weighted average grade for the western paddock calculated at 0.81 g/t Au (88.8m at 0.73 g/t Au from reconnaissance drilling and 107.1m at 0.88 g/t Au from infill drilling).

QUARTERLY REPORT

Bulk samples were collected during the infill drilling program and a ~50kg composite sample from the central N-S line of drilling through each of the tailings paddocks was submitted for metallurgical testwork.

The metallurgical work completed to date indicates that very high levels of gold extraction (95-98%) can be achieved by cyanide leaching of re-ground tailings material, and this coupled with a significant proportion of water soluble gold provides encouragement for efficient processing of the Tick Hill tailings material.

In January 2016 Diatreme announced a maiden mineral resource estimate for tailings material located within the rehabilitated tailings dam at the Tick Hill Gold Project in northwest Queensland (*ASX announcement 19 Jan 2016*). The Indicated Resource is estimated at 630kt at 1.08 g/t Au (at 0.5 g/t Au cut-off) containing 680kg (22,000 troy ounces) of gold.

TABLE 1: TICK HILL TAILINGS RESOURCE ESTIMATE

Category	Location	Au cut-off g/t	Material Volume '000 m ³	Material Density	Material '000 t	Au g/t	Au kg	Au t oz
INDICATED	West Paddock	0.5	245	1.4	345	0.80	275	8,800
INDICATED	East Paddock	0.5	205	1.4	285	1.42	405	13,000
INDICATED	TOTAL	0.5	450	1.4	630	1.08	680	21,800

The resource estimate utilises data from Diatreme's 2015 drilling programs, together with documented design parameters for the tailings dam construction and a high resolution DEM captured by Glencore in 2013. The resource estimate concurs with previous calculations of the tailings material based on historical production and the exploration drilling results.

A summary of information material to understanding of the mineral resource estimate includes;

- Geology – the mineralisation comprises fine sand and silt tailings material within the two paddocks of the historical Tick Hill Gold Mine tailings dam.
- Sampling – 1m samples were collected via a cyclone from aircore drilling of the tailings dam and submitted to a commercial laboratory. Sub-sampling of samples >3.2kg in weight was by riffle splitting. Samples were pulverised and a split taken for analysis.
- Drilling – drilling was undertaken by the company owned and operated aircore drilling rig utilising NQ rods and a blade bit with 3m drill runs. All drill holes are vertical.
- Classification – the mineral resource is classified as Indicated based on the drill and assay data spacing (25m spaced offset grid with 1m downhole samples).
- Analysis – samples were analysed for gold only using a 50g charge for FA (ALS method AA26).
- Estimation – Micromine software was utilised to construct a 3D wireframe for each tailings paddock, using a combination of high resolution DEM data, drill logging data and reported tailings dam design parameters. A block model was generated within the wireframe, and gold values assigned by ID3 interpolation of the drill assay data.
- Cut-off grade – all material within the tailings dam is considered mineralised such that a defined cut-off grade has not been routinely applied to drill data. Evaluation of the resultant block model shows that a nominal cut-off grade of 0.5 g/t Au can be applied to the reported resource estimate.
- Mining and metallurgical parameters – possible mining methods include conventional truck and shovel mining or hydraulic mining. Mining will be relatively simple given the shallow depth/thickness of the mineralisation, lack of overburden, and the free-digging nature of the material. Metallurgical testwork shows that very high levels of gold extraction can be achieved by cyanide leaching of re-ground tailings material.

In March 2016 Diatreme announced that a scoping study completed by an independent external consultant (Metcor) confirmed the viability of a standalone operation processing the identified tailings resource. Tick Hill has the potential for a 20-month operation processing the tailings via re-grinding and a standard CIP/CIL circuit.

Further studies are being planned to help determine the optimal grain size required to balance leach extraction rates with energy requirements for re-grinding of the tailings, which will then allow detailed design of a process flowsheet, determination of capital and operating costs, and development of a financial model to further assess the economic potential for mining and processing of the tailings material.

EUCLA BASIN HM PROJECT (WA)

No field work was undertaken during the quarter, and no exploration field work is planned for the June quarter as the company will be focussed on the Tick Hill Gold Project and Cyclone Project PER.

QUARTERLY REPORT

CAPE BEDFORD SILICA/HMS PROJECT (QLD)

Discussions are ongoing with traditional landowners to facilitate an exploration agreement for the Cape Bedford area and a letter of support for grant of EPM. This project has been identified as an important company priority to allow exploration activities to commence as soon as possible on site.

CLERMONT COPPER PROJECT (QLD)

A review of the Clermont project, and in particular the Rosevale Porphyry Corridor, is continuing, with development of a proposed exploration program.

GRAYS HILL PROJECT (QLD)

The company has identified a number of topographic features within Quaternary sediments on the coastal plain in the eastern part of EPM25117 that may represent targets for HM accumulation. An agreement with the primary landholder is required to facilitate access for reconnaissance exploration.

CASH POSITION

The Company's cash position at 31 March 2016 (Appendix 5B) was \$148K *.

- * **Note:** Scheduled drawdown on convertible note amount of \$500,000 due in the March quarter was progressively drawn to the amount of \$260,000 during the quarter. A further \$195,000 was drawn during April 2016, with the balance to be received in early May 2016. Successive drawdowns of further \$500k tranches due in May and August 2016.

APPENDIX 1

Appendix 1 provides information required under ASX listing rule 5.3.3 for mineral exploration entities.

Dated 29 April 2016

Neil J McIntyre

Chief Executive

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Competent Person Statements

The information in this report that relates to Exploration Results and Mineral Resource from the Tick Hill Gold Project is based on information compiled by Mr. Ian Reudavey, a Competent Person who is a Member of the Australian Institute of Geoscientists. Mr. Reudavey is a full time employee of Diatreme Resources Limited. Mr. Reudavey has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr. Reudavey consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

APPENDIX 1

Appendix 1 provides information required under ASX listing rule 5.3.3 for mineral exploration entities.

Mining tenements held at the end of the quarter and their location

State	Tenement Name	Tenement ID	Location	Interest	Holder	Comments
WA	Wanna Lakes East	E69/2408	Eucla Basin	100%	LSPL	Granted
WA	Wanna South	E69/2425	Eucla Basin	100%	LSPL	Granted
WA	Cyclone	M69/141	Eucla Basin	100%	LSPL	Granted
WA	Cyclone Extended	R69/1	Eucla Basin	100%	DRX	Granted
QLD	Clermont	EPM17968	Clermont	100%	CHAL	Granted
QLD	Parapet	EPM19189	Clermont	100%	CHAL	Granted
QLD	Expedition Creek	EPM19544	Clermont	100%	CHAL	Granted
QLD	Grays Hill	EPM25117	Yeppoon	100%	DRX	Granted
QLD	Cape Bedford	EPM(A)17795	Cape Bedford	100%	DRX	Application
QLD	Tick Hill	ML7094	Duchess	100%	DRX	Granted
QLD	Tick Hill	ML7096	Duchess	100%	DRX	Granted
QLD	Tick Hill	ML7097	Duchess	100%	DRX	Granted

Mining tenements acquired and disposed of during the quarter and their location

State	Tenement Name	Tenement ID	Location	Interest	Holder	Comments
-	-	-	-	-	-	-

Beneficial percentage interests held in farm-in or farm-out agreements at end of the quarter

State	Project Name	Agreement Type	Parties	Interest held at end of quarter by exploration entity or child entity	Comments
WA	Cyclone Zircon Project	Farm-out Heads of Agreement	LSPL and Perpetual Mining Holding Limited	94%	HoA announced Jan 2014, initial 6% farm-out completed 18 Sept 2014
QLD	Tick Hill Gold Project	Farm-out and Joint Venture Agreement	DRX and Superior Resources Limited	100%	Proposed JV announced Aug 2011, formal Agreement announced June 2013, Joint Venture commenced Jan 2015

Beneficial percentage interests in farm-in or farm-out agreements acquired or disposed of during the quarter

State	Project Name	Agreement Type	Parties	Interest held at end of quarter by exploration entity or child entity	Comments
-	-	-	-	-	-

Abbreviations:

E	Western Australia	Exploration Licence	DRX - Diatreme Resources Limited
M	Western Australia	Mining Lease	CHAL – Chalcophile Resources Pty Ltd
R	Western Australia	Retention Licence	LSPL – Lost Sands Pty Ltd
EPM(A)	Queensland	Exploration Permit for Minerals (Application)	
EPM	Queensland	Exploration Permit for Minerals	
ML	Queensland	Mining Lease	