

ASX

ANNOUNCEMENT

ASX:DRX 

QUARTERLY REPORT

HIGHLIGHTS

EXPLORATION ACTIVITIES REPORT QUARTER ENDED 31 DECEMBER 2015

HIGHLIGHTS

- **Cyclone Project Ore Reserve increased by 47% to 140 million tonnes (Mt) at 2.5% heavy minerals (HM) (0.71% zircon) through incorporation of Cyclone Extended mineralisation in mine plan**
- **Meetings with OEPA to progress environmental approvals for Cyclone Project Public Environmental Review (PER), final approvals expected by 1st Quarter 2016**
- **First stage metallurgical testwork on bulk samples of Tick Hill tailings completed, showing significant water-soluble gold content and confirming gold as highly amenable to cyanide leaching**
- **An Indicated Mineral Resource of 630,000t at 1.08 g/t Au (22,000 t oz Au) reported for the Tick Hill tailings**

CYCLONE ZIRCON PROJECT (WA)

The revised Ore Reserve represents a 47% increase in contained HM compared to the previous estimate. It now comprises 140 Mt at 2.5% HM, including 0.71% zircon, containing 3.5Mt of HM with 1Mt zircon. The revised estimate primarily relates to the inclusion of mineralisation from the Cyclone Extended deposit, but also reflects updates to the resource model and mineral resource estimate since the maiden ore reserve was announced back in February 2012. The projected mine life for the project has also risen to 14 years, based on a planned mining rate of 10 Mtpa.

TICK HILL GOLD PROJECT (QLD)

First stage metallurgical testwork completed on bulk samples of tailings material from the Tick Hill Gold Project, with positive results reported.

Work is now being planned to determine optimal grind size to balance gold extraction and energy input, develop a process flowsheet and complete 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)

In mid-December (ASX announcement 14 Dec 2015) Diatreme announced a revised Probable Ore Reserve estimate for the Cyclone Project of 140 Mt at 2.5% HM, including 0.71% Zircon, containing 3.5 Mt of HM, including 1 Mt of Zircon. The revised estimate primarily relates to the inclusion of mineralisation from the Cyclone Extended deposit which was purchased from Image Resources early in 2015, but also reflects updates to the resource model and mineral resource estimate since the maiden ore reserve was announced back in February 2012. This Ore Reserve estimate represents a 47% increase in contained HM from the previous study in 2012.

TABLE 1: CYCLONE PROJECT RESOURCE & RESERVE ESTIMATE

MINERAL RESOURCE													
Resource Category	HM cut-off %	Material Mt	HM %	HM Mt	Slime %	OS %	Head Grade						Zircon Kt
							Zircon %	Rutile %	Leuc %	HiTi %	Alt Ilm %	Si TiOx %	
MEASURED	1.0	156	2.4	3.79	4.2	5.1	0.69	0.08	0.17	0.52	0.26	0.55	1,070
INDICATED	1.0	55	1.8	0.99	4.1	4.5	0.36	0.06	0.06	0.50	0.11	0.31	200
TOTAL	1.0	211	2.3	4.78	4.2	4.9	0.60	0.08	0.14	0.51	0.23	0.50	1,270
Mineral Assemblage							27%	3%	6%	23%	10%	22%	
ORE RESERVE													
Reserve Category	Zircon cut-off %	Material Mt	HM %	HM Mt	Slime %	OS %	Head Grade						Zircon Kt
							Zircon %	Rutile %	Leuc %	HiTi %	Alt Ilm %	Si TiOx %	
PROBABLE	0.4	140	2.5	3.54	4.5	5.1	0.71	0.07	0.17	0.58	0.32	0.57	1,000
TOTAL	0.4	140	2.5	3.54	4.5	5.1	0.71	0.07	0.17	0.58	0.32	0.57	1,000
Mineral Assemblage							28%	3%	7%	23%	13%	22%	

Table Notes

- Rounding may generate differences in last decimal place
- A constant SG of 1.7 has been used to derive material tonnes
- Slime refers to material typically <53um
- OS refers to oversize material typically >2mm
- Mineral Assemblage derived from QEMSCAN® analysis
- Leucoxene (Leuc) – Ti-oxides containing 85 – 95% TiO₂, HiTi - Ti-oxides containing 70 - 85% TiO₂, Altered Ilmenite (Alt Ilm) - Ti-oxides containing <70% TiO₂, Si-bearing Ti-Oxide (Si TiOx) – Ti-oxides containing >10% silica rich Ti minerals.
- Resources are inclusive of Reserves

The Ore Reserve is based upon mine planning parameters developed for the Cyclone Prefeasibility Study, with appropriate recognition of subsequent metallurgical testwork and process flowsheet development undertaken by Mineral Technologies. The pit design includes 84 Mbcm of overburden with a strip ratio of 1:1 however, the strip ratio is considerably lower in the early years of the mine operation.

The Ore Reserve has been classified as Probable based on the accuracy of the project cost estimates (PFS quality) and additional work required for the marketing of Cyclone HMC in China to more accurately define revenue. However, 90% of the Ore Reserve is derived from Measured Resource, and there is a high level of confidence in the other modifying factors applied. The Ore Reserve represents a 75% conversion rate from Mineral Resource for contained HM tonnes.

The Public Environmental Review (PER) Report for the Cyclone Project was released for public review on 29 June for a period of five weeks as required by the WA Environmental Protection Authority (EPA). The Office of the Environmental Protection Authority (OEPA) received submissions from eight respondents during the public review period and provided copies of the submissions to DRX on 24 August 2015. The OEPA also provided a summary of the submissions identifying the principle issues requiring attention by DRX. DRX submitted its report responding to the public submissions on 6 October 2015 to the OEPA.

On 23 November the EPA requested more detailed information for the responses to several of the public review questions. DRX attended a meeting with the EPA on 17 December to present the current status of the project and additional information relevant to the public review. A detailed response providing the additional information that has been requested by the EPA is scheduled for completion and submission to the OEPA on 29 January 2016.

As part of the approvals process DRX will negotiate 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. DRX continues to provide additional project information as requested by the OEPA and other regulatory authorities during the environmental approval process.

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The OEPA will assess the additional PER response, which will be submitted on 29 January 2016, for consideration by the EPA and a recommendation is expected to be finalised during February 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 March 2016.

Diatreme continues to review opportunities to reduce capital and operating cost estimates for the planned Cyclone mine, which is now targeting the supply of a single heavy mineral concentrate product to Chinese mineral separation plants where the final zircon and HiTi products will be produced.

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 in to 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).

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. As the presence of cyanide had been noted in previous environmental sampling of the tailings material, a 20kg sub-sample of the bulks was re-pulped with water for 24 hours and then pressure filtered. Analysis of the solids and solution returned assays showing gold distribution in solution of 11% for the eastern paddock, and 15% for western paddock.

By combining assays from the re-pulping work with earlier assays of the as-received bulk sample, a calculated head grade of 1.27 g/t Au for the eastern paddock and 0.71 g/t Au for the western paddock can be calculated. This correlates well with mass weighted average grades of the included drill samples of 1.33 g/t Au for the eastern paddock and 0.77 g/t Au for the western paddock.

Cyanidation leach testwork on the washed tailings residue was undertaken, with generally low gold extraction rates of 24% for the eastern paddock and 32% for the western paddock. The low extraction rate is considered consistent with 'as-received' tailings material, and sizing analysis and assay indicate that gold distribution is weighted towards the coarser fractions of the tailings material, with 70% of the gold contained in the +75µm

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fractions of both tailings paddocks. As the gold grade increases in the coarser size fractions this suggests that unrecovered gold in the tailings is likely to be directly related to grind size and degree of liberation.

An ultra-fine re-grind of the samples was then undertaken, with the eastern paddock returning 95% gold extraction from a 24-hour leach on a sample with a p80 of 14 µm, and the western paddock returning 98% gold extraction from a 24-hour leach on a sample with a p80 of 11 µm. For both samples very high levels of gold extraction were achieved within 4 hours (89% and 94% respectively). A series of grinding and leaching tests were then undertaken to develop a gold extraction vs grind size recovery curve, with a clear trend between grind size and gold extraction such that gold extraction increases at increasingly finer grind size. The target size would be a trade-off between costs (particularly grinding energy costs) and additional gold extraction.

A sub-sample was also submitted for de-sliming testwork, in which a portion of the tailings (the 'slimes') were removed using a hydrocyclone. This portion was not re-ground prior to cyanide leaching. The results confirmed that a portion of the tailings could bypass a re-grind stage, without a detrimental impact on gold extraction. This would involve optimisation of the hydrocyclone cut-size, so that the final product P80 is fine enough to maximise gold extraction.

The metallurgical work completed to date indicates that very high levels of gold extraction 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.

Subsequent to the reporting period 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 2: 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.

Work is now being planned to assess potential tailings mining and gold processing options, including process flowsheet design. Results from this work will allow completion of a scoping study and guide project development.

EUCLA BASIN HM PROJECT (WA)

No field work was undertaken during the quarter, and no exploration field work is planned for the March quarter as the company will be focussed on the Tick Hill Gold Project and Cyclone Project PER. An application to renew the Wanna Lakes E69/1920 exploration tenure surrounding the Cyclone ML was declined by the WA Department of Mines and the tenement was subsequently relinquished in December 2015.

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. EPM17968 has been renewed for a further five-year term.

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. Discussions are ongoing with the primary landholder to facilitate access for reconnaissance exploration.

CASH POSITION

The Company's cash position at 31 December 2015 (Appendix 5B) was \$21K *.

- **Note:** Scheduled drawdown of \$500,000 on convertible note facility (refer ASX announcement 19th May 2015) due for 31 December 2015 only partially received (\$100,000), with balance of \$400,000 delayed into January due to remittance delays over public holiday period. Balance of \$400,000 now received in full as at 21st January 2016, with a further drawdown of \$500,000.00 due for 29th of February 2016.

APPENDIX 1

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

Dated 29 January 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 Resources from the Cyclone Zircon 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.

The information in this report that relates to Ore Reserves from the Cyclone Zircon Project is based on information compiled by Mr Phil McMurtrie, a Competent Person who is a Member of the Australasian Institute of Mining and Metallurgy. Mr McMurtrie is a director of Tisana Pty Ltd (a consultant to Diatreme Resources Limited). Mr McMurtrie 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 2012 Edition of 'The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr McMurtrie consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

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
WA	Wanna Lakes	E69/1920	Eucla Basin	100%	LSPL	Relinquished

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	