



ENTERPRISES
University of Pretoria

SHORT COURSE IN DIAMOND EXPLORATION AND THEIR PRIMARY AND SECONDARY SOURCES

23–26 October 2018

Presented by the Department of Geology, University of Pretoria

23–25 October 2018

Schoongezich Guest House
369 Schoongezicht Str
Pretoria

26 October 2018

Cullinan Diamond Mine
(Petra Diamonds)
Cullinan

Lead by

Mike de Wit and John Bristow



UNIVERSITEIT VAN PRETORIA
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The **Diamond Exploration and their Primary and Secondary Sources** short course is presented by leading international experts in diamond exploration and evaluation methods, providing you with a unique opportunity to discover diamond deposits of both a primary and secondary nature, the origin and characteristics of diamonds and an introduction to diamond mining and marketing. The course not only covers both the theoretical and practical aspects of diamond exploration, but also characterisation and evaluation of primary and secondary source deposits.

With no similar course or training offered in Africa or internationally, the panel of experts will take you on an intricate journey of diamond exploration and mining, while gaining an excellent grasp of the source rocks that carry diamonds with up-to-date insights into:

- Diamonds and their origins
- Geophysical techniques appropriate to diamond exploration
- Mineral chemistry and petrography
- Kimberlites/lamproites and cratons
- Modern diamond mining methods
- Diamond treatment and recovery methods
- Secondary diamond deposits

This internationally recognised short course is foremost presented to fourth-year Geology students at the University of Pretoria by a panel of international experts on the latest developments and new technological applications in diamond exploration methods.

COURSE TOPICS

1. Diamond exploration:

History of diamonds; World diamond markets; Origin of diamonds; Kimberlites/lamproites and cratons; Structural geology and diamond exploration; Modern exploration techniques; Geophysics and diamonds; Mantle structure and diamond genesis; Indicator minerals chemistry. (Presented by *Mike de Wit, John Bristow, Fanus Viljoen, Hielke Jelsma, Gavin Selfe, Hilde Conwright and Sarah Burness*)

2. Primary and secondary sources of diamonds:

Classification of primary sources of diamonds (including kimberlites/lamproites); Characteristics and settings of secondary (alluvial) diamond deposits in South Africa (Orange River, Vaal River, North-West Province), Africa and India; Marine diamond deposits. (Presented by *Johan Stiefenhofer, Lyndon de Meillon, Tania Marshall, John Ward and Mike de Wit*)

3. Evaluation and economic valuation of diamond deposits:

Due diligence and geological requirements; Diamond valuation (rough and polished); Size frequency studies; Mining methods; Evaluation of alluvial deposits; Financial valuation models. (Presented by *John Bristow, Alex Holder, Derek Lahee, Grant Ziegler and Tania Marshall*)

4. Visit to the Cullinan Diamond Mine

(Facilitated by *Petra Diamonds*)

COURSE FEES

R6 000.00 per delegate (VAT incl.) – GSSA members

R7 000.00 per delegate (VAT incl.) – non-GSSA members

Course fees include all course material (on DVD), refreshments and lunch during contact days, as well the underground visit to the Cullinan Diamond Mine.

Funds raised from the course are partly earmarked for registration expenses for Honours students in Geology and partly for a postgraduate fund for junior lecturers at the University of Pretoria.

ACCREDITATION AND CERTIFICATION

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CONTENT ENQUIRIES

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COURSE PROGRAMME

DAY 1 | 23 October 2018

Time	Topic	Facilitator
08:30–08:45	Introduction	Mike de Wit / Wlady Altermann (HoD)
08:45–09:15	History of diamond exploration in Botswana	Mike de Wit <i>Majimba Geoconsulting</i>
09:15–09:45	Overview of the world diamond market and impact of synthetic gemstones	John Bristow <i>Global Diamond Network</i>
09:45–10:30	The origin and evolution of diamonds	Fanus Viljoen <i>University of Johannesburg</i>
Tea		
11:00–11:45	The classification of kimberlites and lamproites and the impact of geology on resource definition and estimation	Johann Stiefenhofer <i>De Beers</i>
11:45–12:30	Geophysical methods applied to diamond exploration	Gavin Selfe <i>GRS Consult</i>
Lunch		
13:30–14:15	The setting of kimberlites and other diamond bearing primary rocks	Hielke Jelsma <i>Anglo American</i>
14:15–15:00	The application of structural geology in diamond exploration	
Tea		
15:30–16:15	Modern diamond exploration methods	Mike de Wit <i>Majimba Geoconsulting</i>
16:15–17:00	Review and discussion	

DAY 2 | 24 October 2018

Time	Topic	Facilitator
08:30–09:30	The continental mantle structure and mineralogy	Sarah Burness <i>University of Witwatersrand</i>
09:30–10:00	Indicator mineral chemistry and their application to diamond targeting	
10:00–11:00	Indicator mineral chemistry and microdiamond techniques as applied to diamond exploration	Hilde Cronwright <i>MSA Group</i>
Tea		
11:30–12:30	Formation of land-based alluvial diamond deposits with an emphasis on the Orange River	John Ward <i>Majimba Geoconsulting</i>
Lunch		
13:30–14:30	Ultra-low grade Middle Orange River, Riet River and Lower Vaal River alluvial diamond deposits	Lyndon de Meillon <i>Paleostone Consulting</i> John Bristow <i>Global Diamond Network</i>
14:30–15:15	African and other alluvial diamond deposits	Mike de Wit and John Ward <i>Majimba Geoconsulting</i> Tania Marshall <i>Explorations Unlimited</i>
Tea		
15:45–16:30	South African and Namibian west coast marine alluvial diamond placers	John Ward <i>Majimba Geoconsulting</i>
16:30–17:00	Review and discussion	

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DAY 3 | 25 October 2018

Time	Topic	Facilitator
09:00–09:45	Mining methods applied to diamondiferous kimberlites with particular reference to underground methodologies	Alex Holder <i>Petra Diamonds</i>
09:45–10:30	Developing a successful kimberlite diamond mining culture	
Tea		
11:00–11:45	Overview of modern diamond processing and recovery methods, including mineral particle sorting and X-ray technology	Derek Lahee <i>Consulmet</i>
11:45–12:30	Diamond valuation – rough and polished	Grant Ziegler <i>Flawless Diamond Trading House</i>
Lunch		
14:00–14:45	Evaluation and valuation criteria and drivers for kimberlite deposits	John Bristow <i>Global Diamond Network</i>
14:45–15:30	Evaluation of alluvial deposits	Tania Marshall <i>Explorations Unlimited</i>
Tea		
16:00–16:30	Final discussion and closure	

DAY 4 | 26 October 2018

Time	Topic	Facilitator
07:30–16:00	Underground and surface visit to Cullinan Diamond Mine	Petra Diamonds



Above: The Cullinan Diamond Mine (operated by Petra Diamonds) on the outskirts of Pretoria (Tshwane). It has been several decades since the last major diamond mine discovery, and the industry and diamond market are looking for additional natural diamond production sites in the future.