

Diamond in southern Africa: back to the beginning

Southern Africa diamond resources
a summary

Mike de Wit

Tsodilo Resources Ltd
University of Pretoria

7th March 2016
PDAC

Topics

- **Africa's building blocks**
- **Production from an African perspective**
- **Southern African resources**
- **Developments on the sub-continent**
- **The big and beautiful**
- **Summary remarks**



122.5 ct blue, Cullinan mine. Petra Diamonds

Overview of Diamond Resources in Africa

in 'The Mineral Fields of Africa'

**Special publication for the 35th
International Geological Congress (IGC)**

2016 Cape Town

Bhebhe Zi

Davidson Jim

Haggerty Steve

Hundt Paul

Jacob Jürgen

Joy Sojen

Lynn Mike

Marshall Tania

Skinner Charles

Smithson Karl

Stiefenhofer Johann

REVITT Anthony

Roberts Martin

Spaggiari Renato

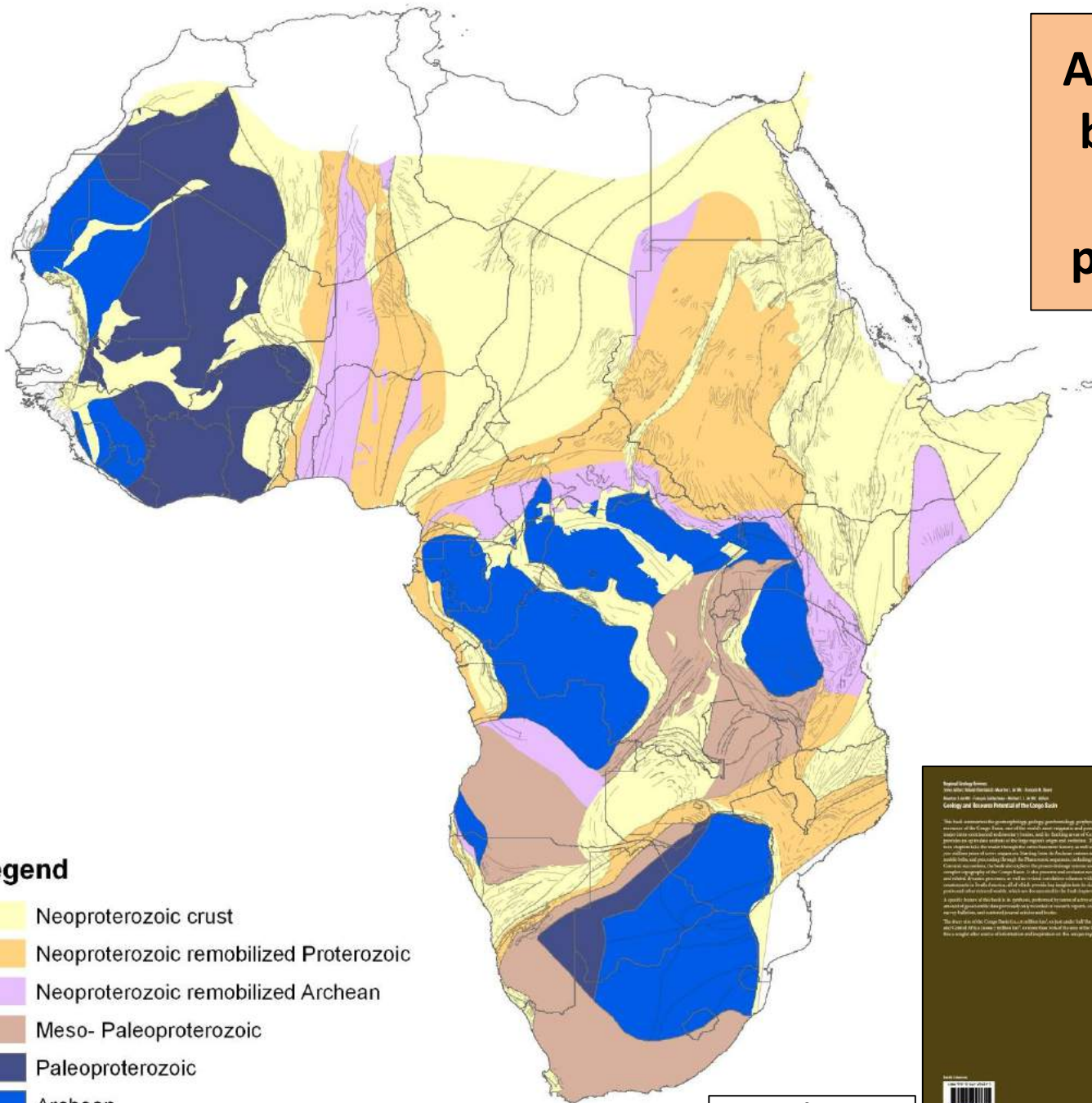
Ward John

Wilson Mike

Wolmarans Anton

Acknowledgements

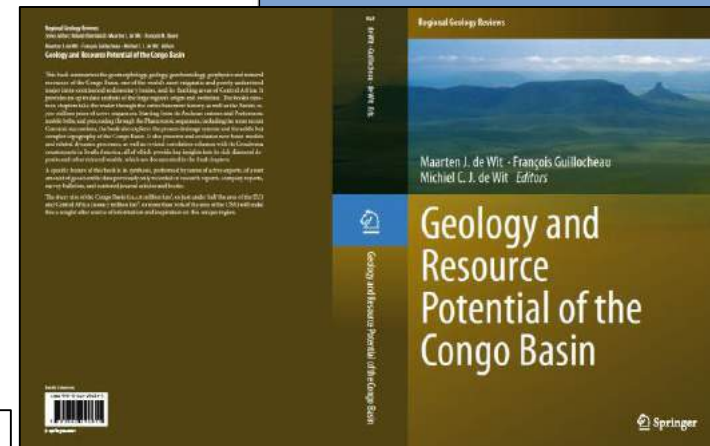
African basement building blocks, 'hotspots' for primary deposits



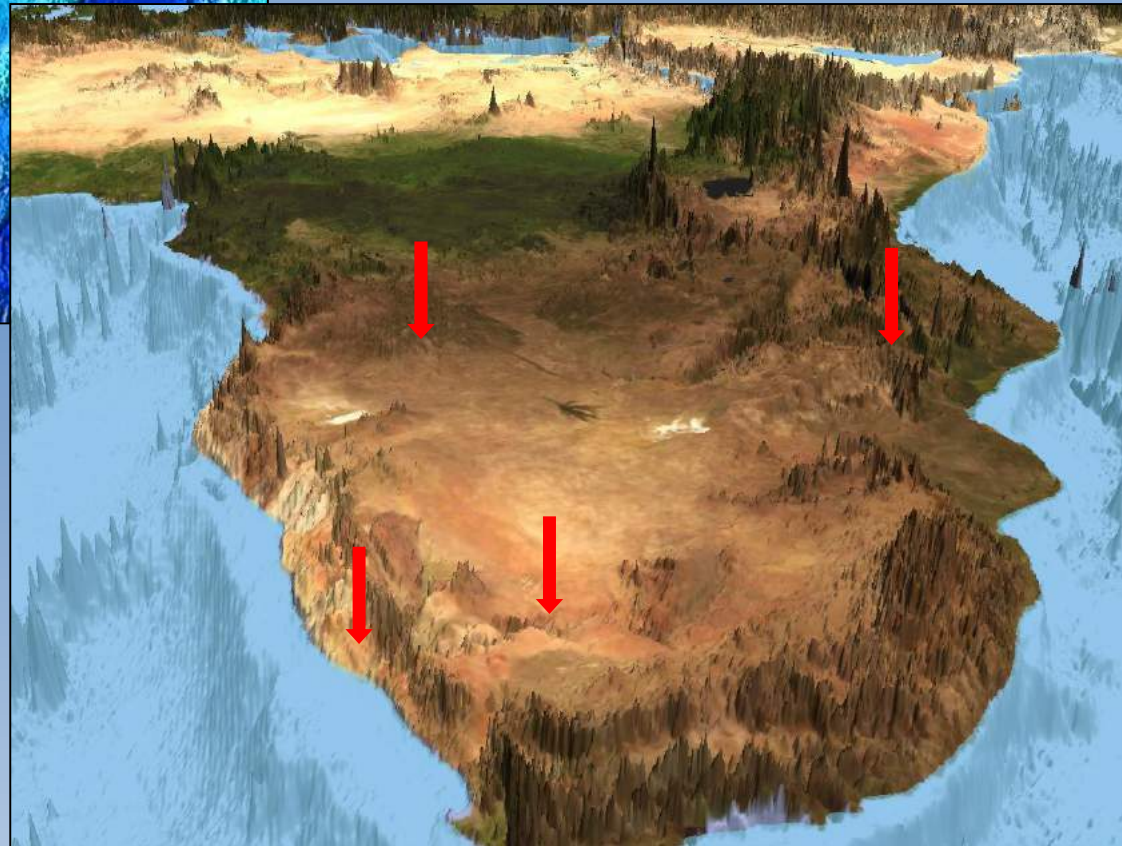
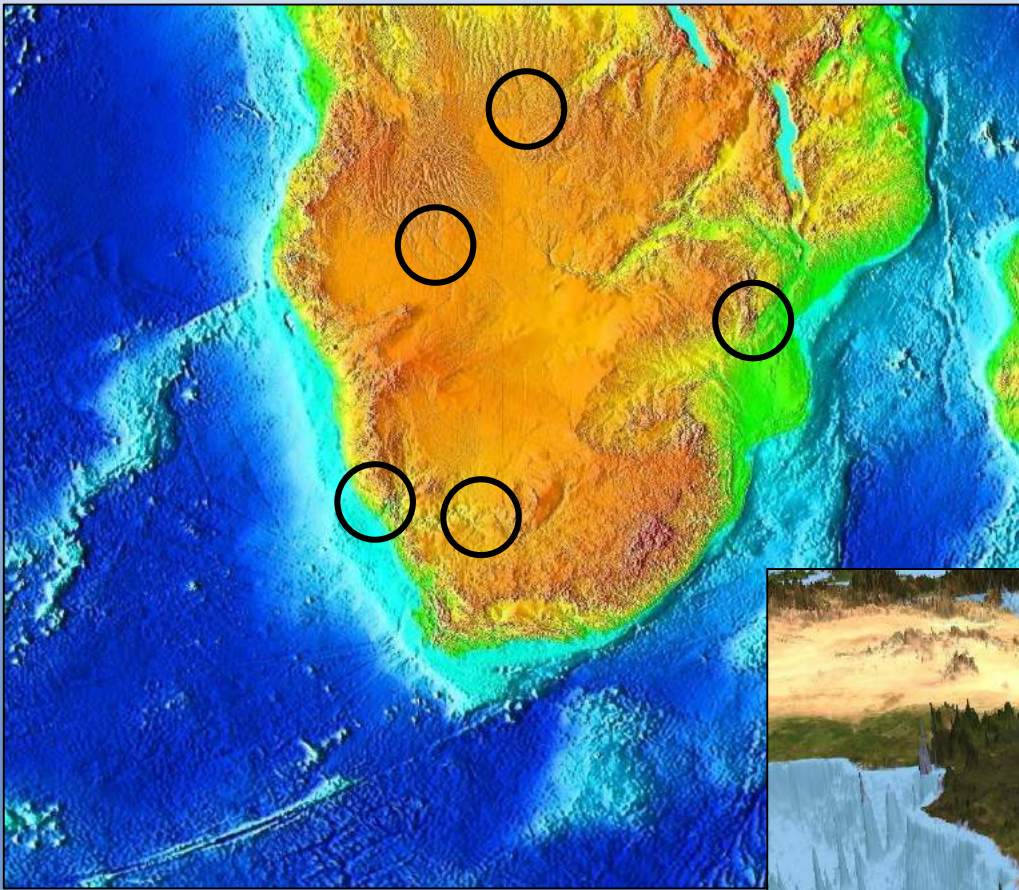
Legend

- Neoproterozoic crust
- Neoproterozoic remobilized Proterozoic
- Neoproterozoic remobilized Archean
- Meso- Paleoproterozoic
- Paleoproterozoic
- Archean

De Wit 2014



Africa's topography and alluvial 'hotspots'



Production from an African perspective

History

0.8 Mct in 2,125 yrs.

350 ct/a

15 Mct in 144 yrs.

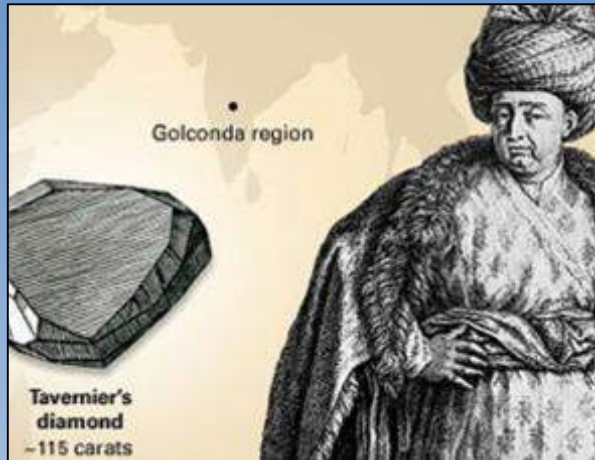
125,000 ct/a

5,154.64 Mct in 145 yrs.

35,549,000 ct/a

400 BC

2014



India 400 BC

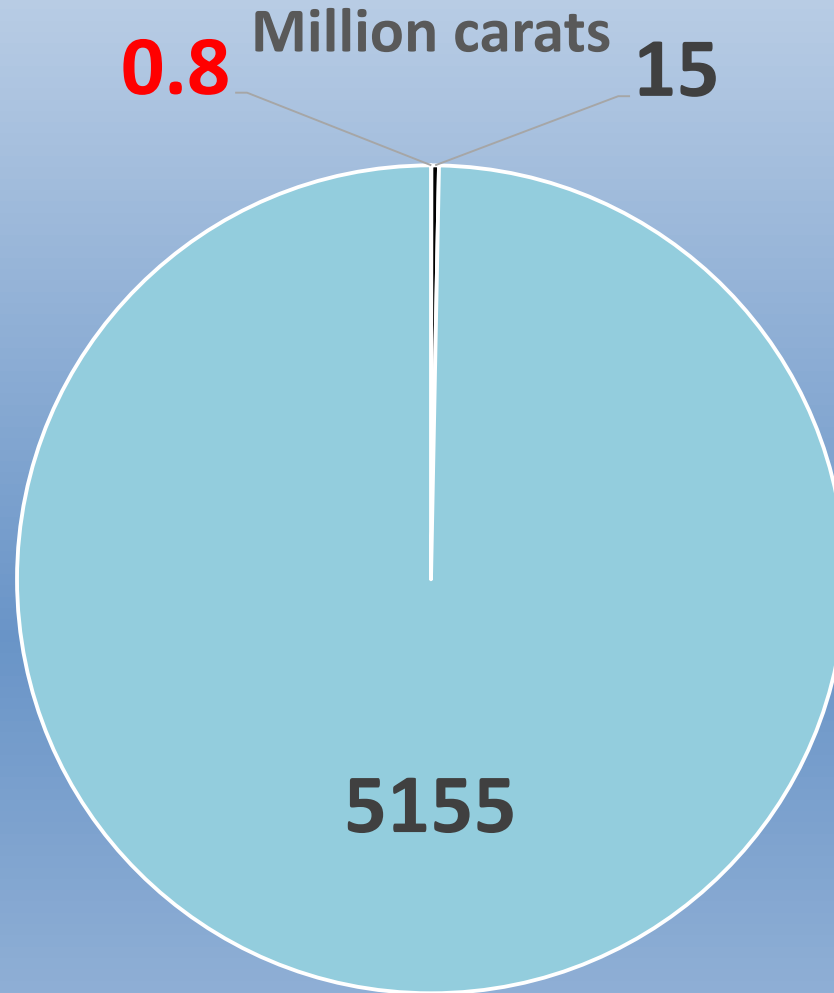


Brazil 1725



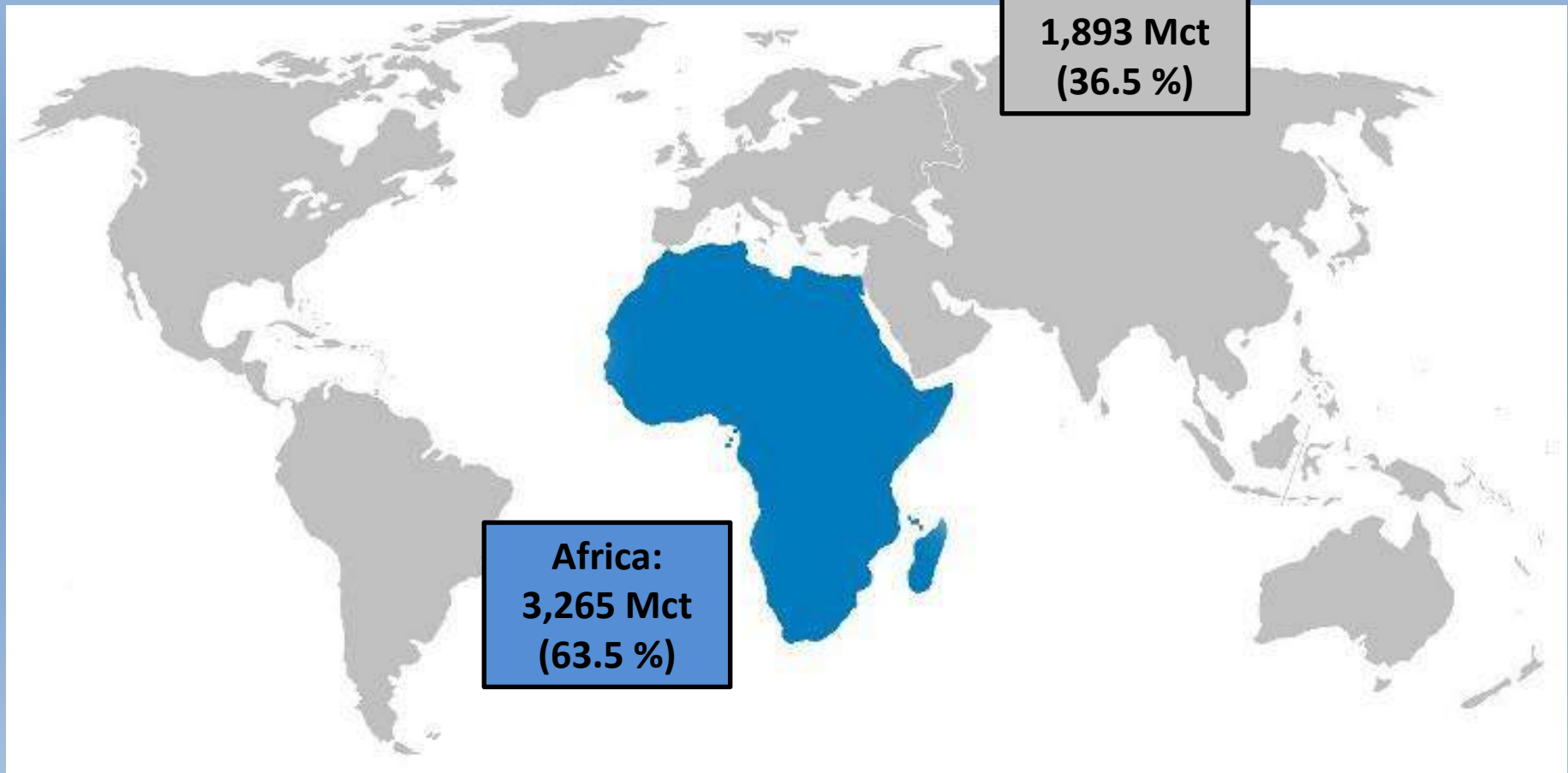
South Africa 1869

Global historical production (incl. 2014) = 5.17 Bct



■ 400 BC - 1725 ■ 1726 - 1869 ■ 1870 - 2014

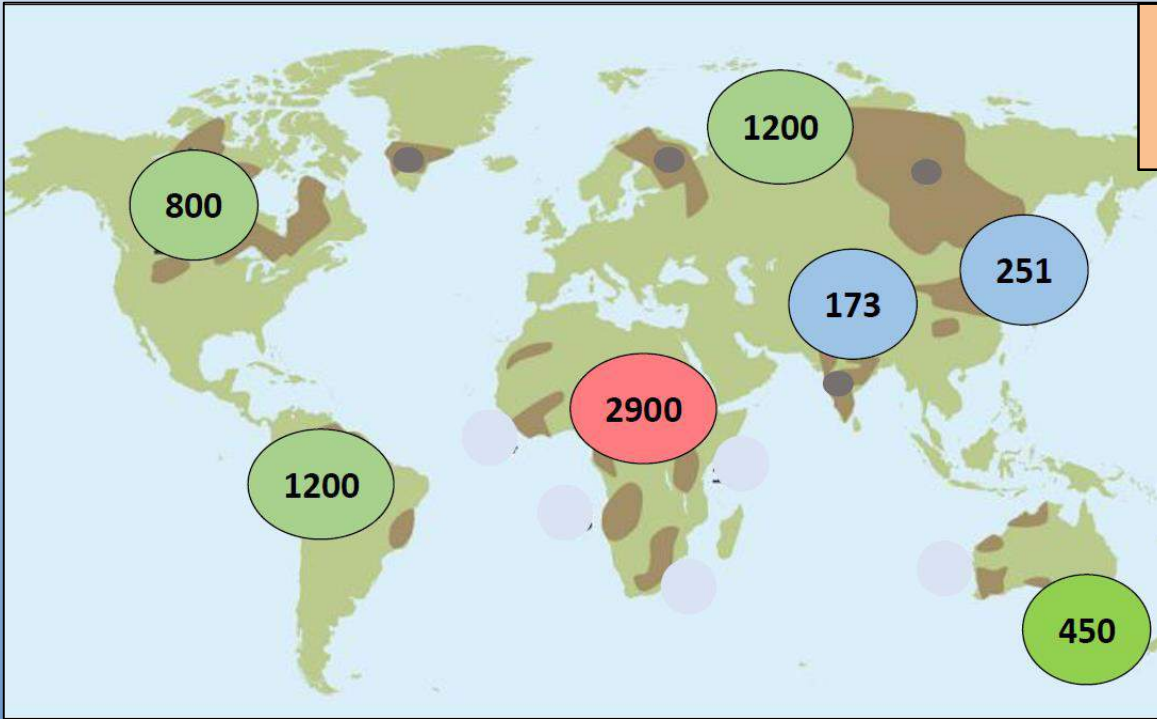
Global historical production (including 2014) = 5.17 Bct



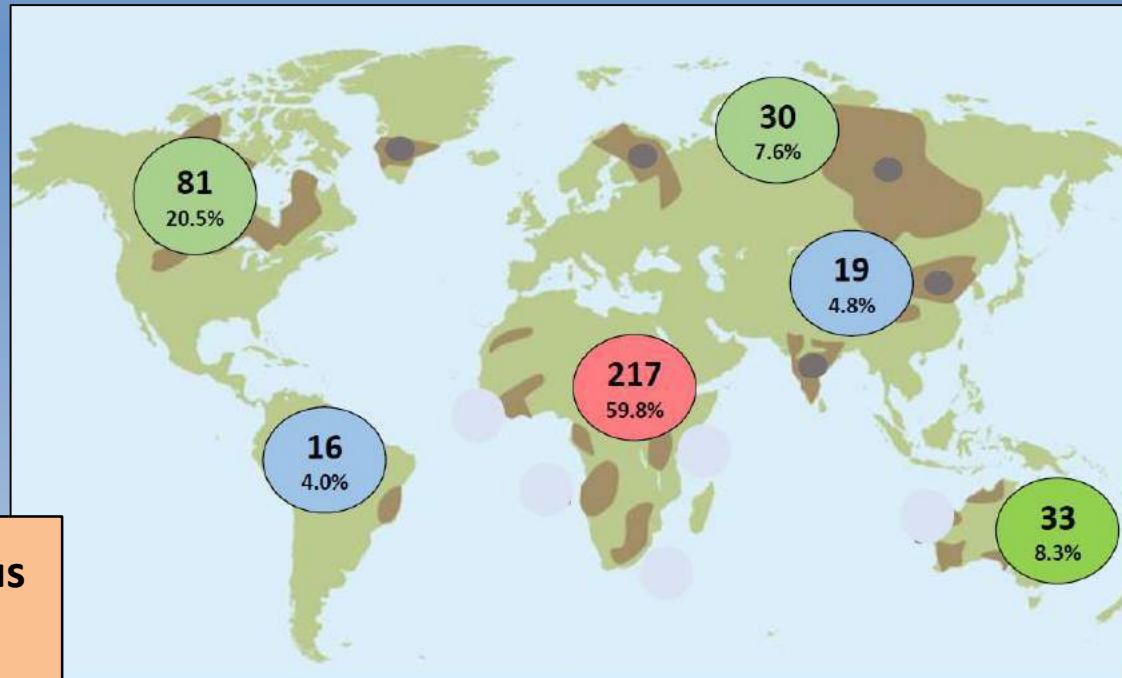
**Africa:
3,265 Mct
(63.5 %)**

**ROW
1,893 Mct
(36.5 %)**

Global distribution of kimberlites/Lamproites (n=6,974)




Global distribution of diamondiferous kimberlites/Lamproites (n=396)



Southern African Resources

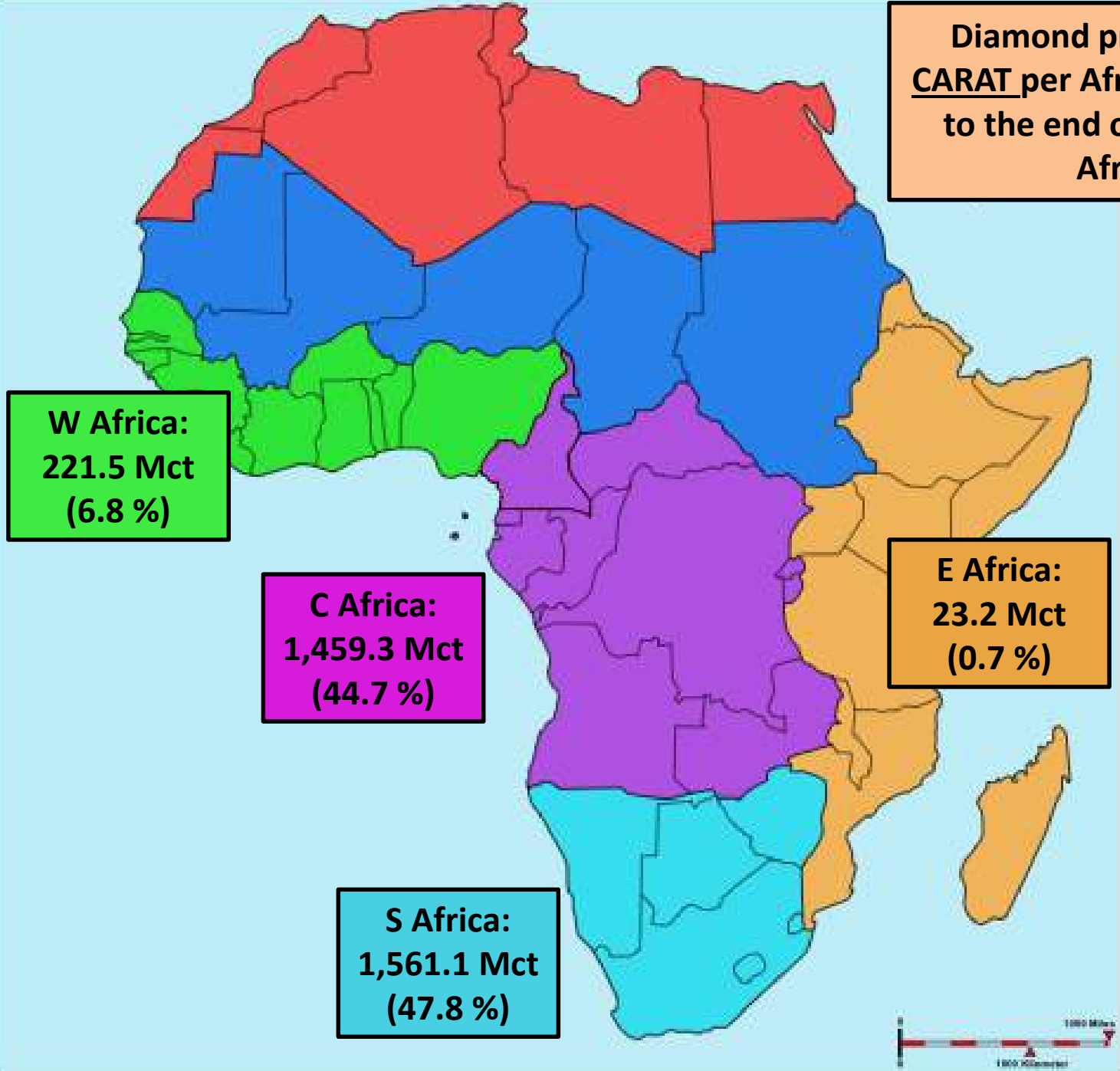
African share of global CARAT production up to and including 2014

Region	Total Million Carats	% Mct
Africa	3,265.1	63.5
Rest of the World	1,877.4	36.5
Total	5,142.5	100.00



Region	Total Million Carats	% Mct
West Africa	221.5	4.3
Central Africa	1,459.3	28.4
Southern Africa	1,561.1	30.4
East Africa	23.2	0.5
ROW	1,877.4	36.5
Total	5,142.5	100.1

Diamond production in CARAT per African region up to the end of 2014 (% of Africa)



**W Africa:
221.5 Mct
(6.8 %)**

**C Africa:
1,459.3 Mct
(44.7 %)**

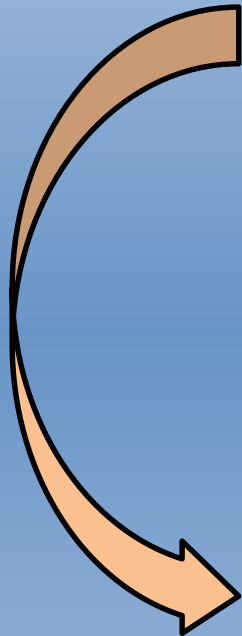
**E Africa:
23.2 Mct
(0.7 %)**

**S Africa:
1,561.1 Mct
(47.8 %)**

African Region	% of Global
WA	4.3
CA	28.4
SA	30.4
EA	0.5
ROW	36.5
Total	100.01

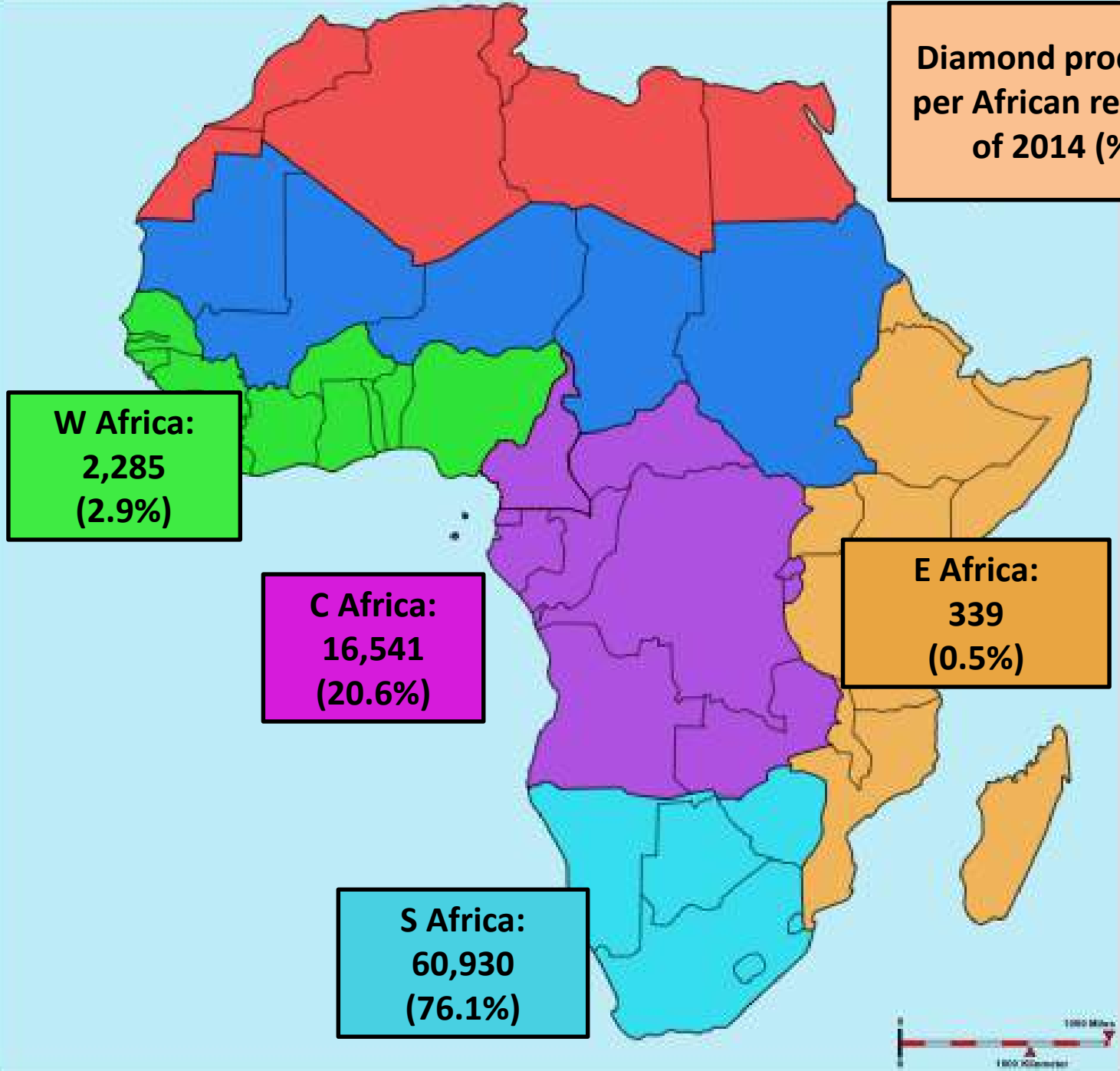
VALUE of global production up to and including 2014

Region	Total US\$ m	% US\$ m
Africa	80,095	58.5
ROW	56,889	41.5
Total	136,984	100.0



Region	Total US\$ m	% US\$ m
West Africa	2,285	1.7
Central Africa	16,541	12.1
Southern Africa	60,930	44.5
East Africa	339	0.3
ROW	56,889	41.5
Total	136,984	100.1

**Diamond production in US\$
per African region up to end
of 2014 (% of Africa)**



**W Africa:
2,285
(2.9%)**

**C Africa:
16,541
(20.6%)**

**E Africa:
339
(0.5%)**

**S Africa:
60,930
(76.1%)**

Average US\$/Ct	
Regions	US\$/ct
WA	261.1
CA	59.4
SA	168.8
EA	322.7
ROW	101.4
Total	116.2

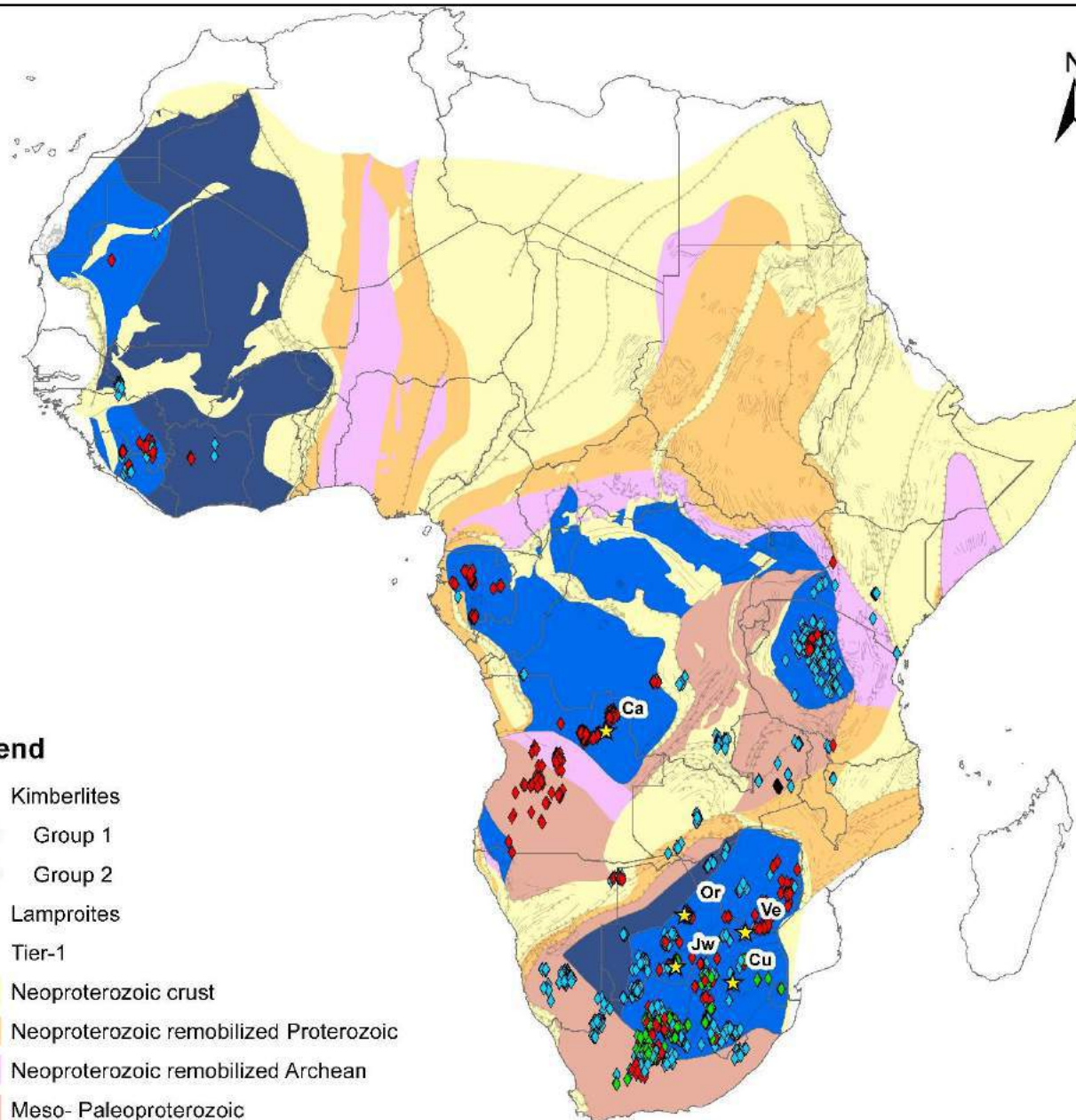
Tier structure for primary diamond deposits

- **Tier 1 – Having more than US\$20b of contained revenue – from start to depletion**
- **Tier 2 - Having produced more than 0.4mct/a for at least five consecutive years**
- **Tier 3 – Have to potential to produce between 0.05 Mct and 0,4 Mct/a over a minimum period of 5 years.**
- **Tier 4 – Mines (small pipes, blows and dykes) that produce or have produced less than 0.05 Mct/a**
- **Tier 2,3 and 4 make up some 80% of the deposits and contribute 20% to global production**

Tier – 1 Diamond Mines

Legend

- ◆ Kimberlites
- ◆ Group 1
- ◆ Group 2
- ◆ Lamproites
- ★ Tier-1
- Neoproterozoic crust
- Neoproterozoic remobilized Proterozoic
- Neoproterozoic remobilized Archean
- Meso- Paleoproterozoic
- Paleoproterozoic
- Archean



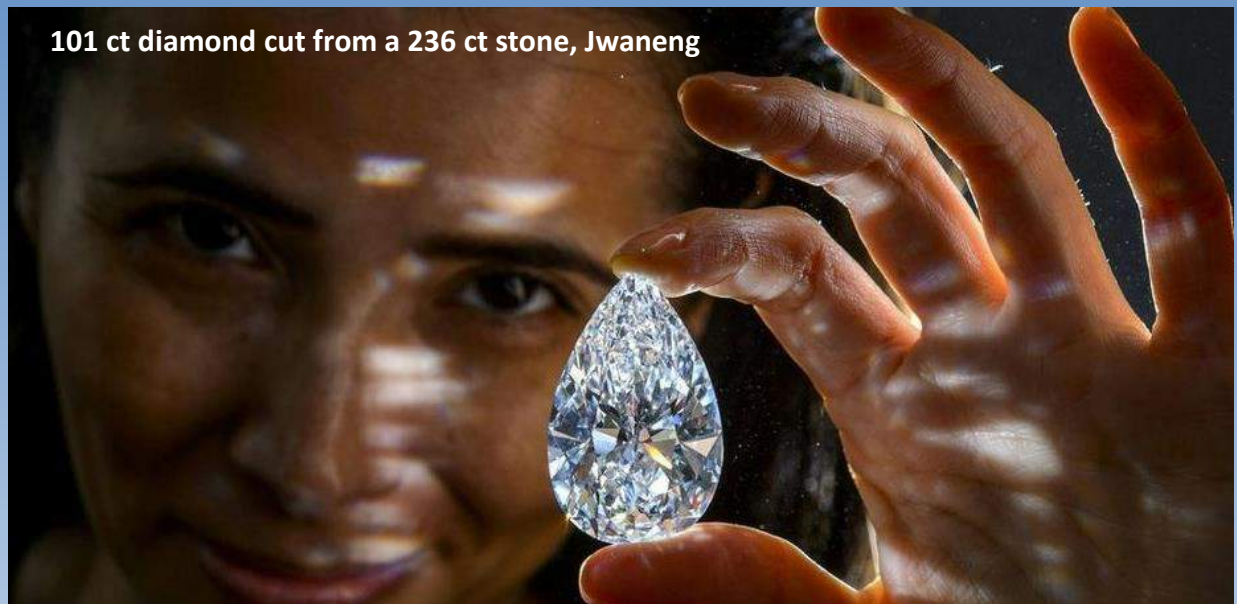
- Globally there are:
- ±7000 kimberlites
 - 7 are Tier 1 Mines
 - 5 of which are in Africa (4 in SA; 1 in CA).

Tier – 1 Diamond mines in Africa

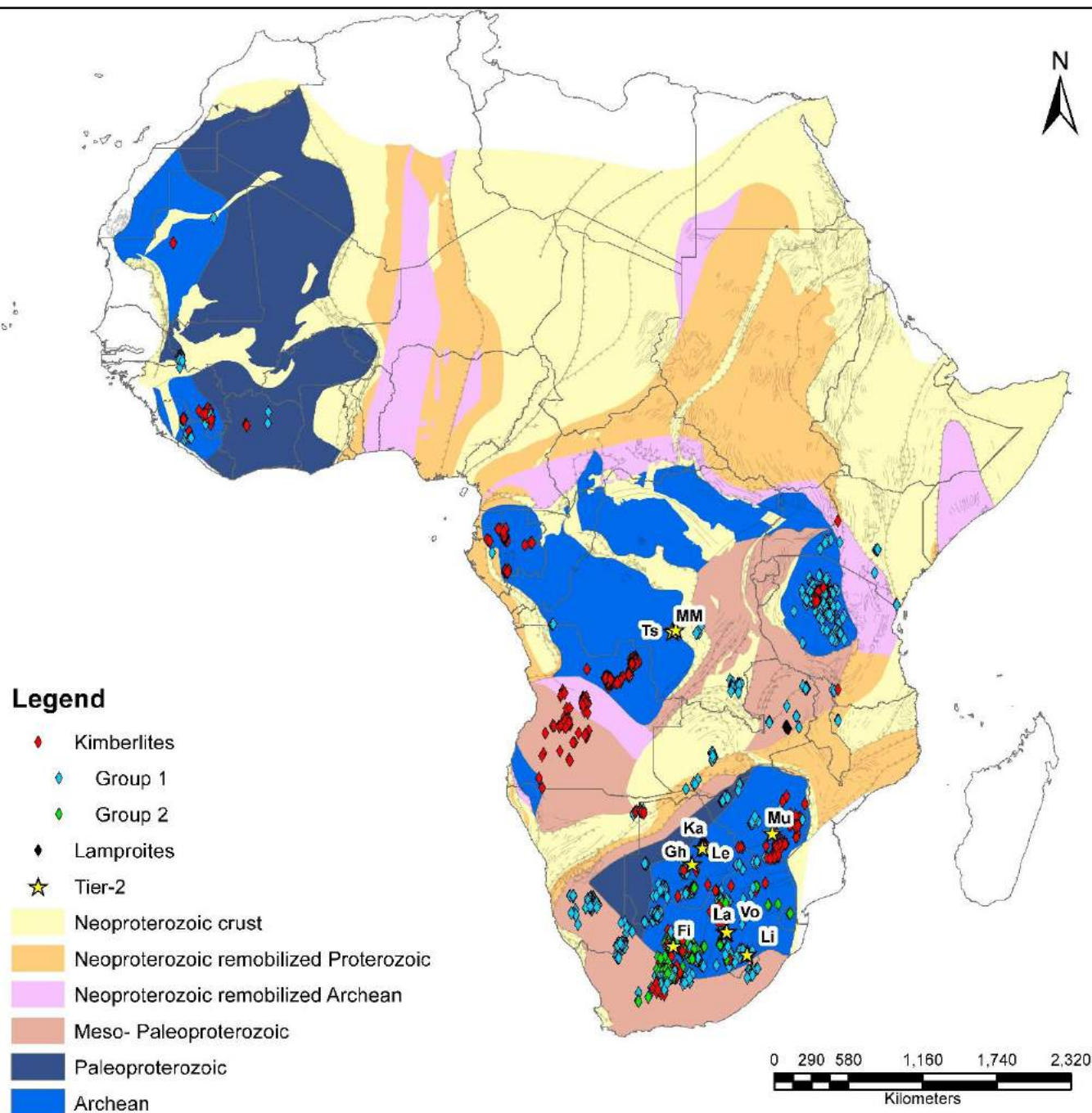
Mine	Mine opened	Age (Ma)	Group	Size (Ha)	Tonnes (Mt)	Grade (cpht)	Contained diamonds (Mct)	Ct produced*	LOM (yrs)	Mct/a
Orapa	1971	93	1	118	505.2	7	335	21(Cut 3)	11.16	
Jwaneng	1982	240	1	54	42	7	341	20 (Cut 8)	10.64	
Cullinan	1903	1,115	1	32	4	7	145	+50	0.89	
Venetia	1992	519	1	23.3 (3x)	238.1	7	192.9	108	27 (UG)	3.07
Catoca	1997	118	1	63.6	217	64.5	140	70	30	6.7
Total					1,709.4	72.5	1,239.3	999		32.5

Contained diamonds of Tier 1 mines in Africa: 1,240 Mct

* Up to end of 2014



Tier – 2 Diamond Mines



**There are 10 Tier 2
mines in Africa:**

- SA = 8
- CA = 2

In SA these are in:

- Bots = 3
- RSA = 3
- Les = 1
- Zim = 1

Tier – 2 Diamond mines in Africa

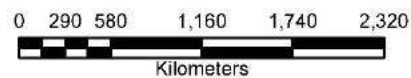
Mine	Discovered/ Discoverer	Age (Ma)	Group	Size (Ha)	Tonnes (Mt)	Grade (cpht)	Contained diamonds (Mct)	Cut-off (mm)	LOM	Mct/a
Tshibwe (DRC)	1955 Miba		1	60	107.4	56.8	61.0		18	3 - 6 (2016)
Mbuji-Mayi (DRC)	1946 Forminiére	71	1	22.6 (M1)	61.2	88.8	54.3		>50	0.8 -1
Finsch° (RSA)	1960 Fincham/Schwabel	118	2	17.9	85.2	60.2	51.3	1.00	16 (UG)	1.4
Liqhobong⁵ (Lesotho)	1957 Diggers	85 and 90	1	8.6	89	29	25.8	1.00	15	1.1
Ghaghoo+ (Botswana)	1981 Falconbridge	87	1	10.3	108.2	18.98	20.5 (524 m)	1.50	15	0.5
Murowa⁴ (Zimbabwe)	1997 Rio Tinto	538	1	4.5 (2x)	19	90			20	0.4
Lace/Crown² (RSA)	1896	133.2±2.8	2	2.9 (2x)	35.6	40.12				0.4 – 0.5
Karowe³ (Botswana)	1970 De Beers	88 and 93	1	9.5	69.1	15.4	10.7 (1000 m)			
Voorspoed* (RSA)	1906 Harger	131	2	12	33.0	21.8				0.61
Lethlakane* (Botswana)	1970 De Beers	93?	1	15.2 (2x)	18.5	28.4 OP 24.8 Tail	4.9 (1000 m)	1.05	4 (UG)	1.03
Total					626.2	44.8	266.2			9.63

Contained diamonds of
Tier 2 mines in Africa:
266 Mct

Tier – 3 Diamond Mines

Legend

- ◆ Kimberlites
- ◆ Group 1
- ◆ Group 2
- ◆ Lamproites
- ★ Tier-3 Active
- ☆ Tier-3 Not Active
- Neoproterozoic crust
- Neoproterozoic remobilized Proterozoic
- Neoproterozoic remobilized Archean
- Meso- Paleoproterozoic
- Paleoproterozoic
- Archean



There are 20 Tier 3 mines in Africa:

- SA = 12
- CA = 4
- WA = 3
- EA = 1

In SA these are in:

- Les = 4
- Bots = 3
- RSA = 3
- Swa = 1
- Zim = 1

Tier-3 Diamond mines in Africa (+0.05 to -0.4 Mct/a): Resources – Indicated and inferred resources (incl. reserves)

Mine	Discovered/ Discoverer	Age (Ma)	Group	Ha	Tonnes (Mt)	Grade (cpht)	Contained diamonds (Mct)	Cut-off (mm)	LOM	Mct/a
Kimberley° (RSA) (Bultfontein, Dutoitspan, Wesselton)	1870 1870 1890	84 (78 to 92)	1	29.2 (3x)	65.9	9.7	6.41	0.5 and 1; Reserves 1.5	8 (UG)	0.14
Koffiefontein° (RSA)	1870	90	1	11.1	154.6	4.2	6.65	0.5 and 1;	11 (UG)	0.07
Letseng[†] (Lesotho)	1957 Nixon	94.6	1							0.09
Kao (Lesotho)⁶	1954 Diggers	83	1						1	0.12
Lemphane² (Lesotho)	1957 Jack Scott		1	6	46	2	0.92	2.00?	10 (OP)	0.07
Damtshaa* (Botswana)	1967 De Beers	93?	1	13.5 (2x)	49.5	21.5	11.2	1.65	19 (OP)	0.19 (2012)
Lerala⁴ (Botswana)	1991 De Beers	1,364	1	6.2 (5x)	12.2	25.5	3.1	1.00	7	0.4
Mwadui° (Tanzania)	1940 Williamson	52	1	146	1016.1	3.3	33.10	1.15	20	0.19
Camutue W (Angola)	1958	120?	1	9	9 (to 150 m)	9.6				0.15
Camatchia (Angola)	1955	120?	1	29.4	120 (to 400 m)	8	0.96			0.17
Camagico (Angola)	1966 Diamang	120?	1	23		30				
Koidu K1 (Sierra Leone)	1930	146	1	0.45	5.0	67	3.31	300 – 400 US\$/ct	5 (OP) 12 (UG)	0.35
Koidu K2 (Sierra Leone)				0.5	4.4	33	1.7			
Baoulé/K23⁵ (Guinea)	1999		1	5	22.2			1.25; S\$/ct	10	0.3
Camafuca C³ (Angola)	1952	120?	1	160						
Mothae (Lesotho)	1961 Jack Scott		1	8.8				100	Care & Maintenance	
BK11 (Botswana)	1974 De Beers	93?	1	8					Care & Maintenance	
Jagersfontein (RSA)	1870		1	12						
Dokolwayo (Swaziland)	1975 De Beers	203	2	2.8						0.04 -0.07
River Ranch (Zimbabwe)	1975 De Beers	519?	1	5.2		30	Closed in 1998 and 2012			0.4
Total					2044.5	15.4	89.3			2.24

**Tier – 3 Diamond mines in Africa
(+0.05 to 0.4 Mct/a)**

**Contained diamonds of
Tier 3 mines in Africa:
90 Mct**

Mine	Mt	CPHT	Mct
Kimberley	25.9	10.8	2.8
Jwaneng	36.6	46.0	16.8
Lethakane (reserves)	34.9	24.2	8.5
Lethakane (resources)	51.9	27.1	14.1
Orapa	151.7	58.2	82.0
Koingnaas	11.4	3.95	0.9
Cullinan	165	10	17.1
Koffiefontein	65		1.4
Total	542.4		143.3

Main tailing resources

Petra and Ekapa to buy Kimberley retreatment operations from De Beers

Business Day
December 2015

Contained diamonds for main tailing dumps: 143 Mct

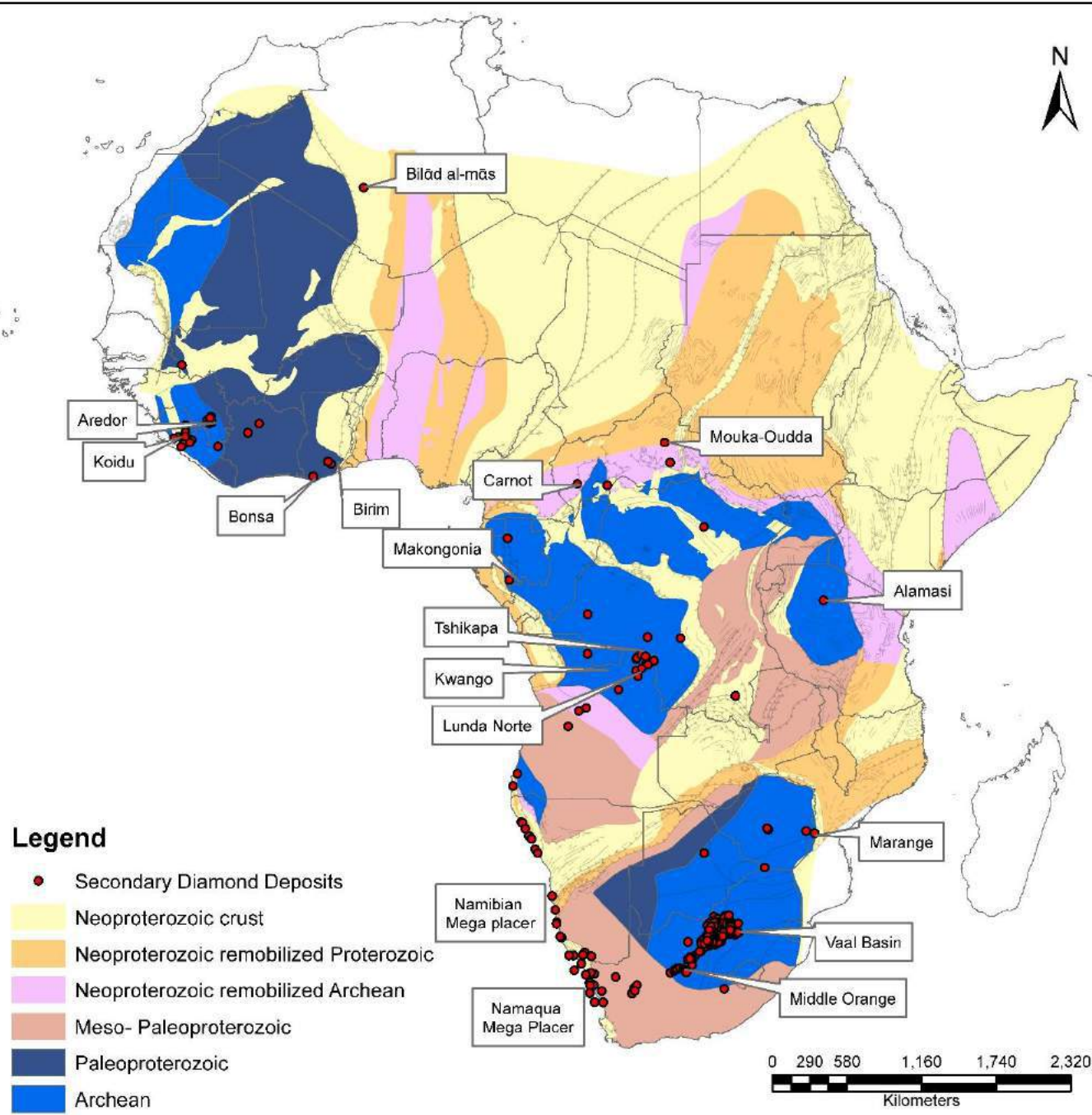
High-tech solution for Lethakane tailings project. The P2.2-billion LMTRTP (Lethakane Mine Tailings Resource Treatment Project) is meant to safeguard jobs.....

Creamer Media
19th February 2016



Tailings at Cullinan Mine 2012

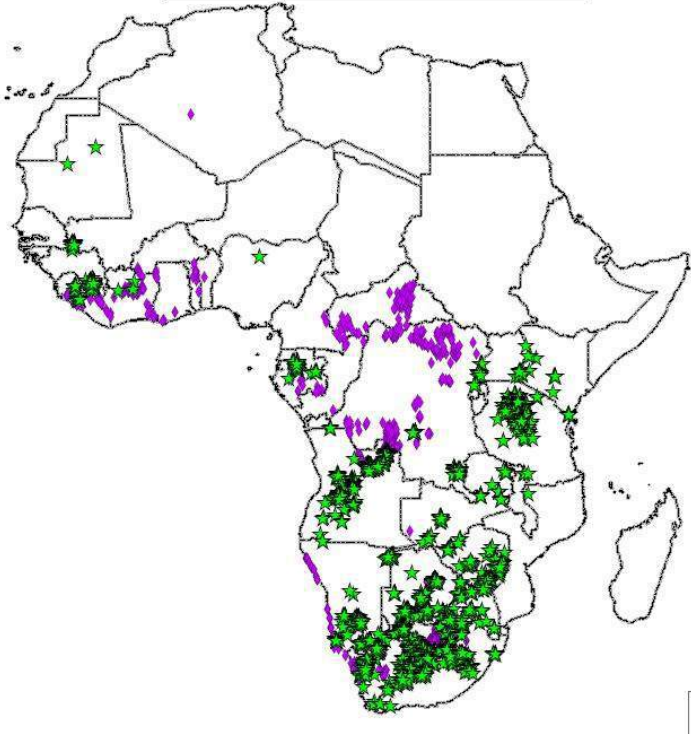
Alluvial Diamond Mines



- Contained diamonds (Mct) per region:**
- SA = 20
 - CA = 120
 - WA = 40
 - EA = 0

Estimation of contained diamonds in Africa

Africa Alluvials and Kimberlites



Contained diamonds per deposits type - Mct

Deposit type	Contained Diamonds Mct	%
Tier 1	1,239.3	64.4
Tier 2	266.2	13.9
Tier 3	89.3	4.7
Mine Tailings	143.3	7.5
Alluvial	180	9.4
Total	1,918.1	99.9

Contained diamonds per region - Mct

	Kimberlites	Alluvial	Tailings	Total	%
W Africa	8.1	40	-	48.1	2.5
C Africa	257.4	120	-	377.4	19.7
E Africa	33.1	-	-	33.1	1.7
S Africa	1,296.2	20	143.3	1,459.5	76.1
Total	1,594.8	180	143.3	1,918.1	100.0

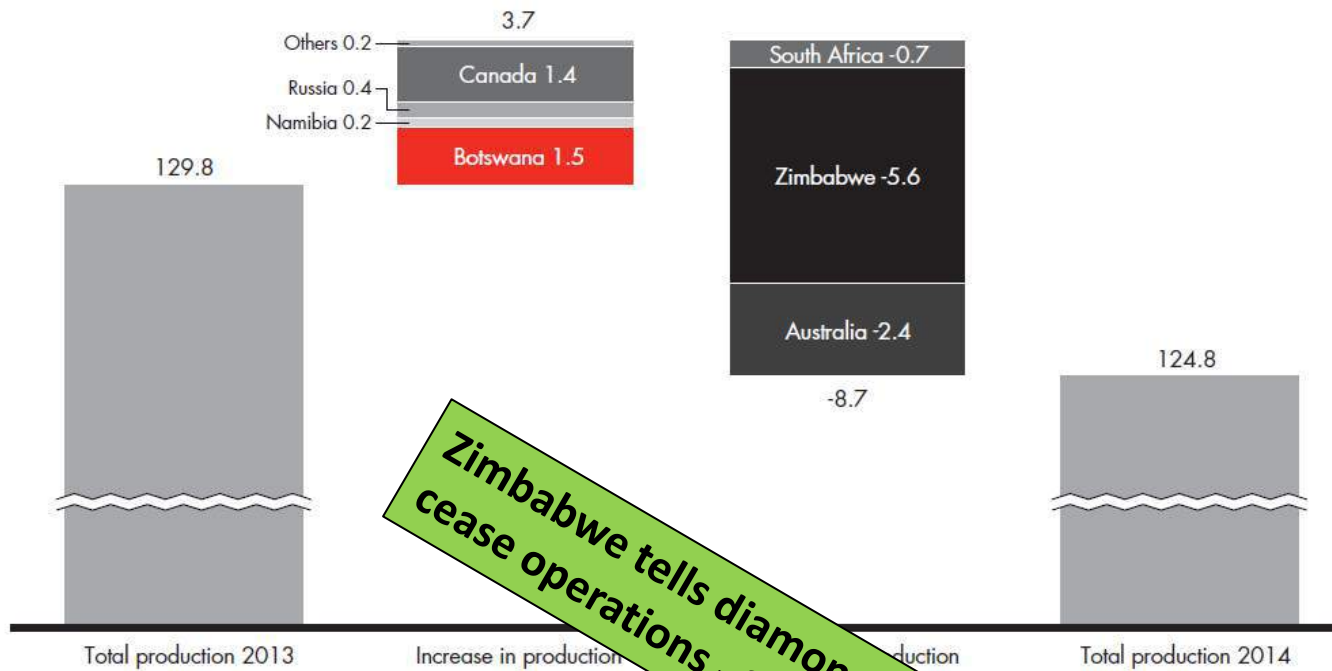
357 ct Letseng mine, Gem Diamonds



Developments on the sub- continent

Major drop of Zimbabwe production

Annual production by country, millions of carats



Bain 2015 ids tracked by Kimberley Process are included

Year	Mct
2008	0.8
2009	1.0
2010	8.4
2011	8.5
2012	10.1
2013	10.4
2014	5.9
2015	3.5

Zimbabwe tells diamond mining companies to cease operations - 22nd February 2016

Zimbabwe Projects Drop in Mining Production as Reserves Decline
 Aug 18, 2015 By Rapaport News



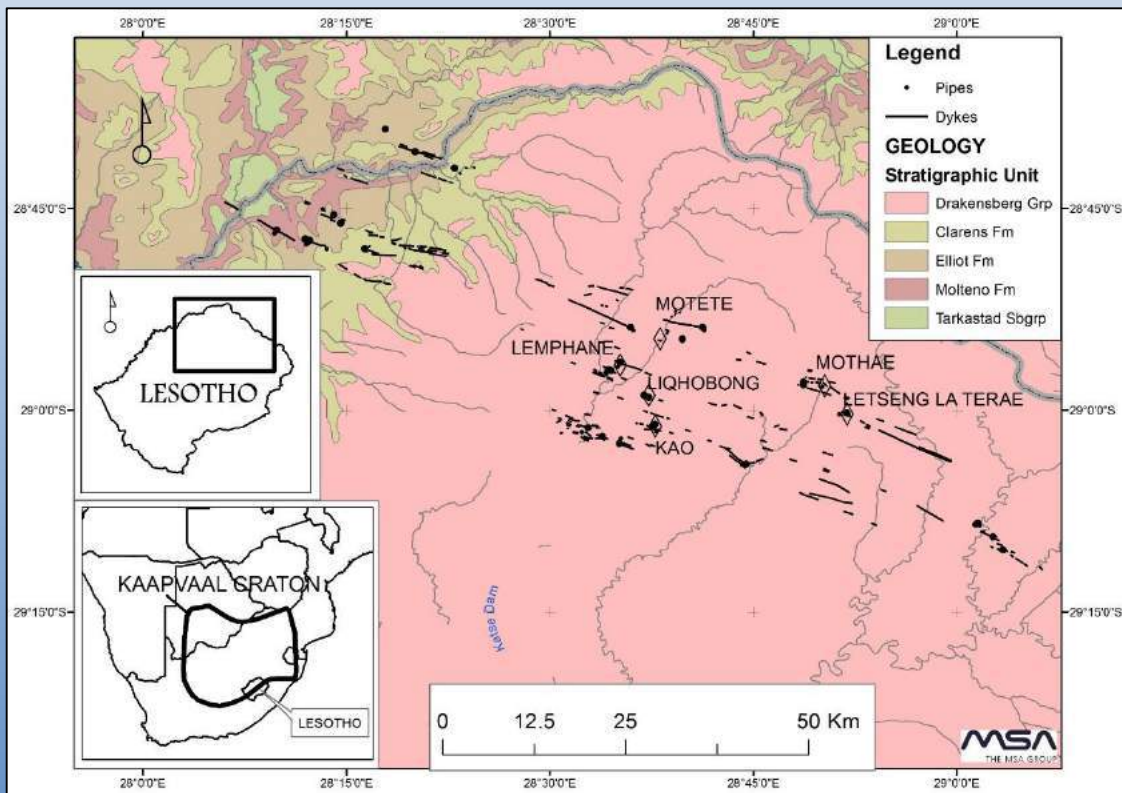
Murowa Diamonds Closes Amid Troubled Times for Zimbabwe Diamond Industry
 October 18, 15 by David Brummer

Zim minister: Marange diamonds have 'dramatically shrunk'
 25.02.15, 11:41 / [Mining](#)

Some brownfield developments

Project	Objective	Cost
Venetia UG Plant upgrade	To increase through put to 6Mt/a; UG mining beyond 2040	R 20b
Cullinan C-cut expansion and procession plant	Increase production to 2.2Mct/a (2m = ROM, 0.2 = tailings).	US\$ 142.8m
Finsch Block5	Increase production from 1.89 Mct (2.9 Mt) to 2 Mct (3.5 Mt)	R 260m
Karowe plant phase 2 upgrade	To deal with harder kimberlite, improve large diamond recoveries and reduce diamond breakage	US\$ 55m
Letseng plant 2 phase 1 upgrade	Increase production to 250,000 t/a	US\$ 4.2m
Liqhobong	New mine, start producing Q4 2016	R 2.1b
Lace Mine	Development of Upper K4 (UK4) & 470 m level block cave	R 750m
Jwaneng Cut 8	Expand the pit to extend LOM to 2028	US\$ 3b

Development in Lesotho



Kimberlite	Resource Mt	Contained diamonds Mct	CPHT	US\$/ct
Letseng La Terae	294	5.03	1.7	2,530
Mothae X	39	1.06	2.7	1,062
Kao	183	11.7	6.4	201
Liqhobong	89	26	32.1	156E
Motete	0.6	0.5		
Lemphane	46	0.92	2.3	1,500E
		45.2		

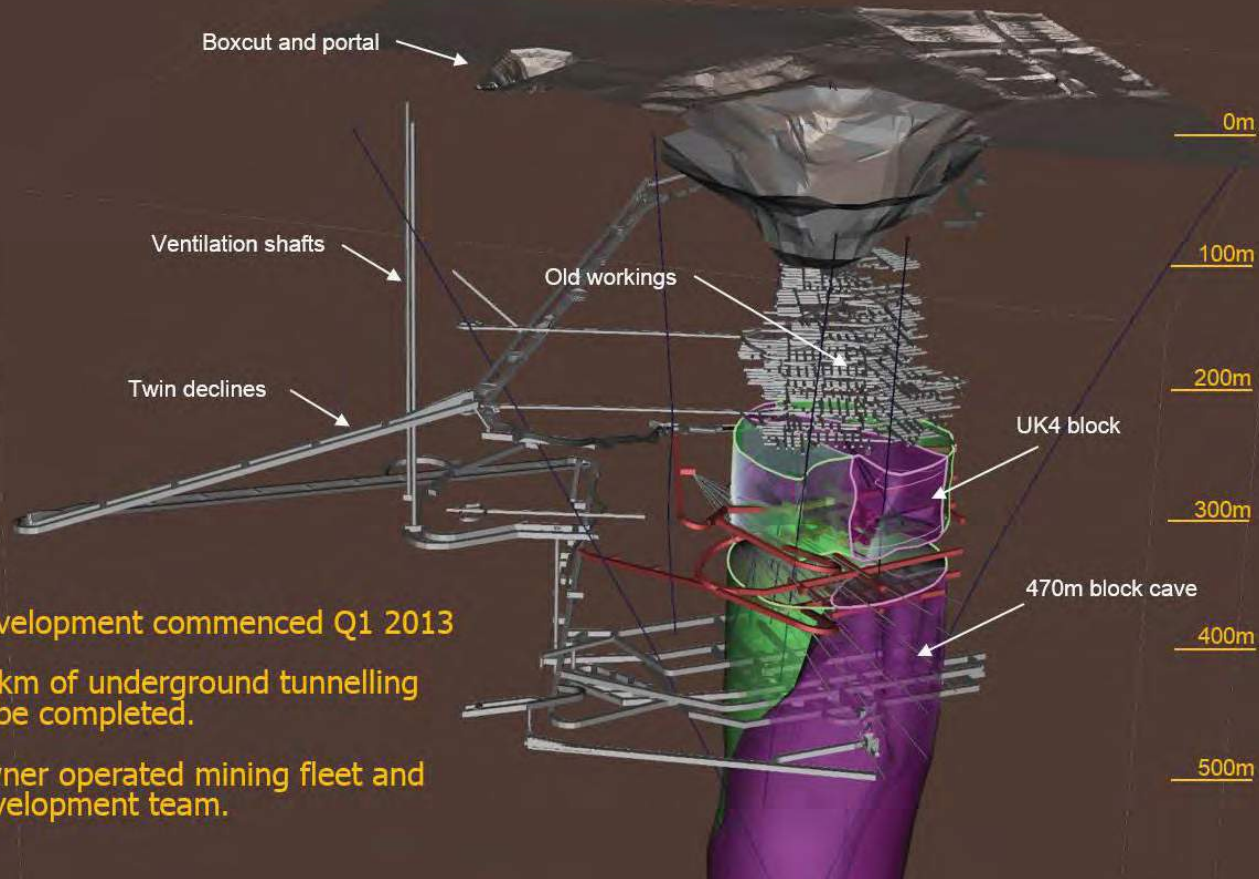
Contained diamonds 45 Mct

Venetia (De Beers, Tier 1 mine) going underground



- **2013 – 2021 development of UG mine at a cost of US\$ 2B**
- **Extend LOM (UG mining of K01 and K02) to 2043**
- **To deliver 96 Mct from 130 Mt at a rate of 5.9 Mtpa**
- **Total annual production: 4.4 Mct/a (3.5 Mct from K01 and 0.9 Mct from K01)**
- **2014 production was 3.2 Mct**

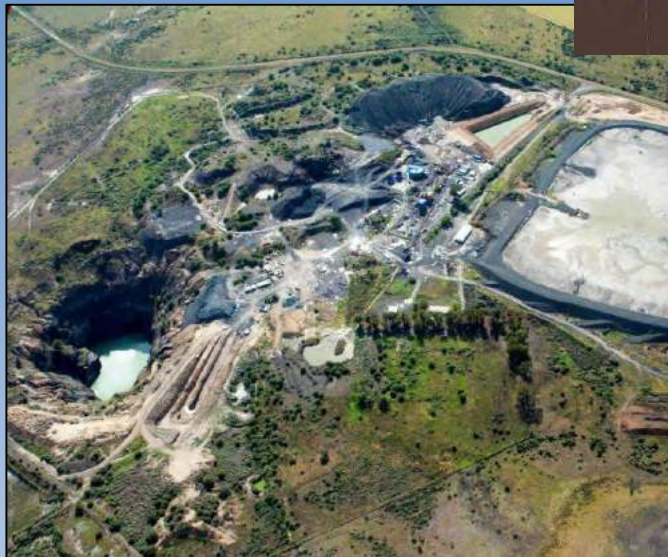
Lace Mine (Tier 2): DiamondCorp plc



Development commenced Q1 2013

+8km of underground tunnelling to be completed.

Owner operated mining fleet and development team.



- 38.5 Mt Resource to 920 m level, to deliver 9.4 Mct.
- Presently: Upper K4 mine block and 470 m development
- Increase BCO from 1 mm to 1.25 mm lowers treatment costs and water usage, and value at US\$164/ct
- Introduction of optical and waste sorter could increase production from 500,000 to 700,000 ct/a. (K6 = 85% internal waste; K4 = 45% internal waste).
- LOM 26 yrs

15.2 carat recovered from tailings, July 2014.

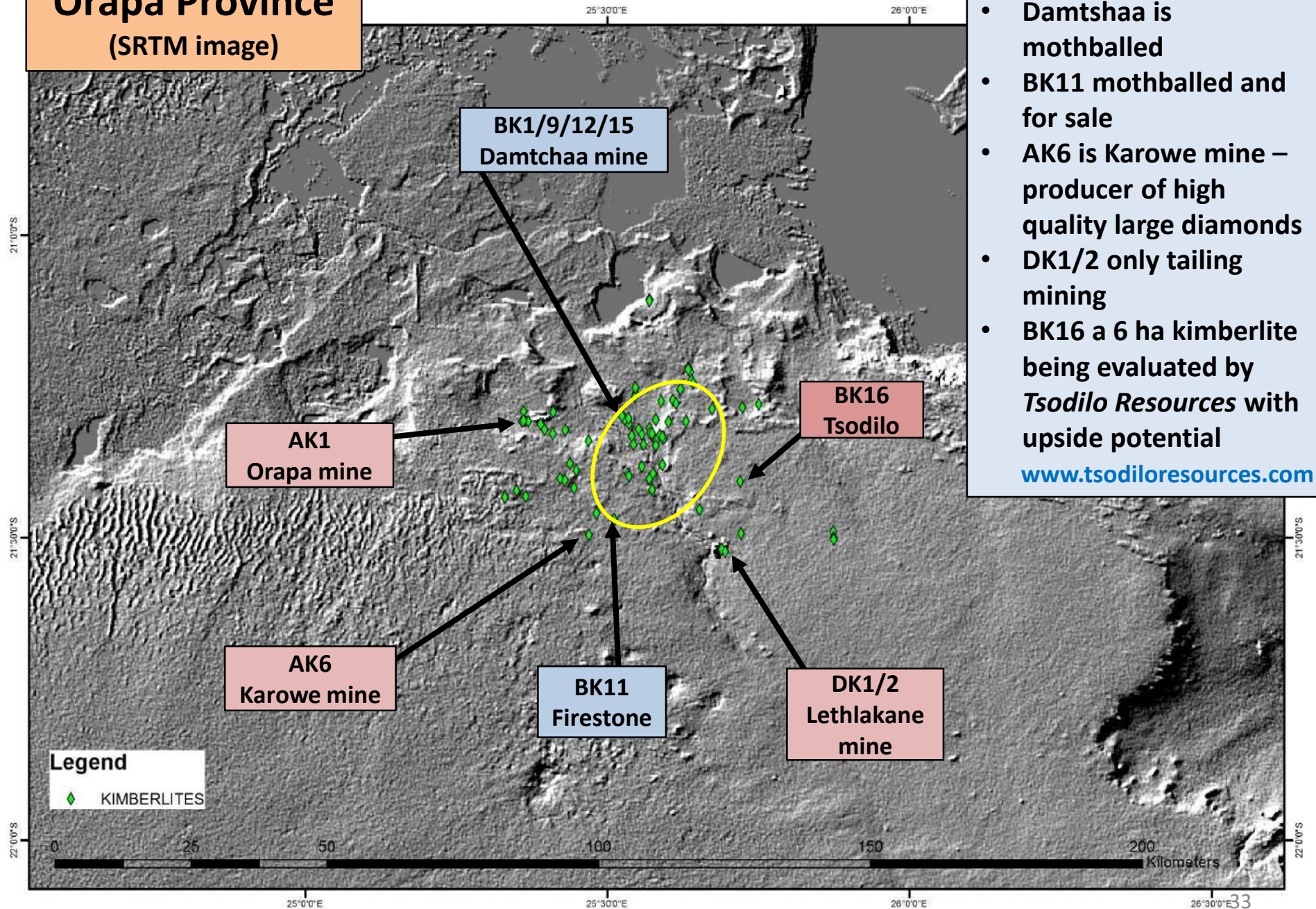


Lace cont.



- High quality gem diamonds
- Specials recovered from dumps and development program
- History of large stones up to 122 ct, 72ct, 53ct & 47ct
- Potential for pink and lilac diamonds

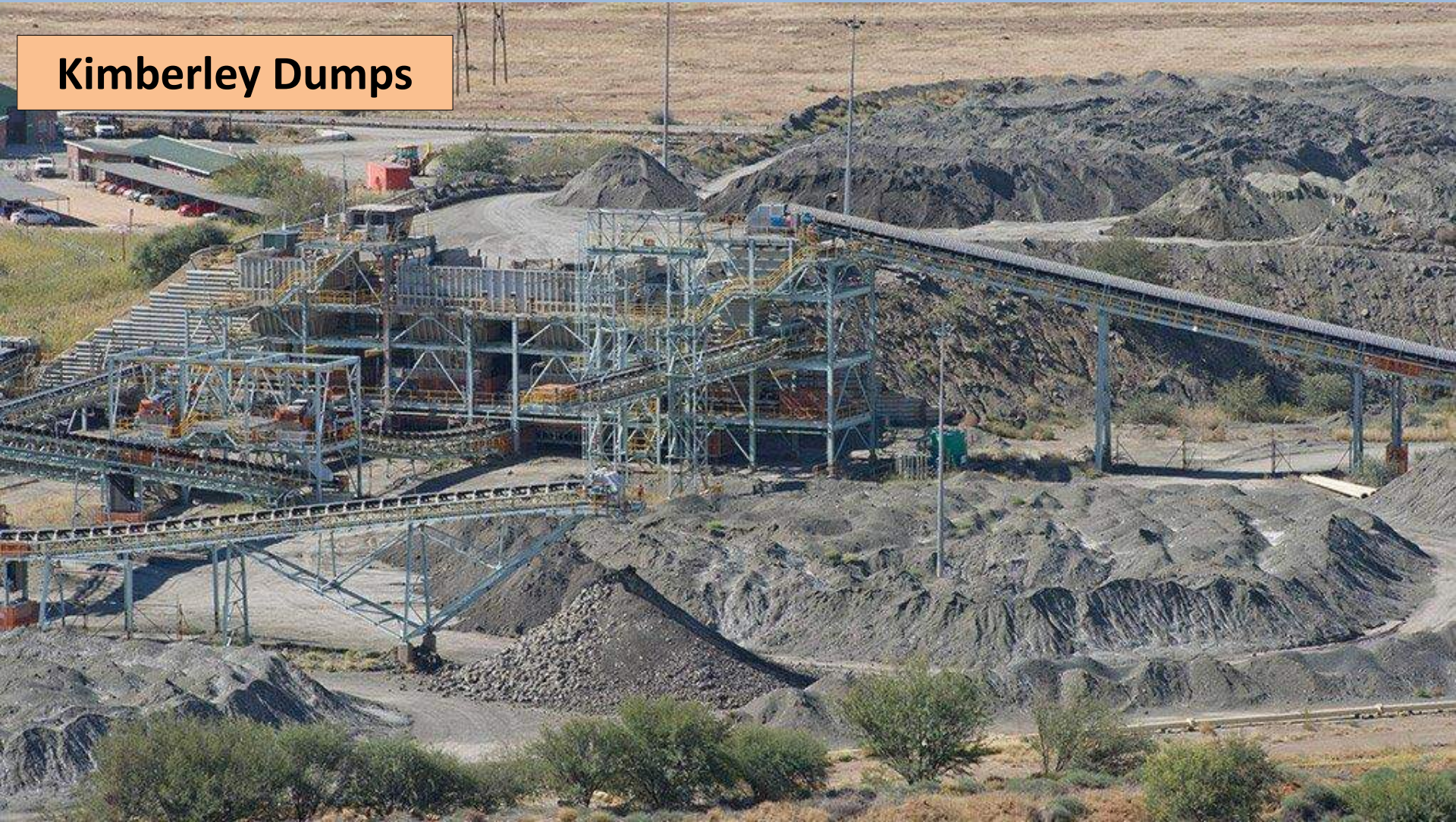
Orapa Province (SRTM image)



- **AK01 = Tier 1 mine**
- **Damtshaa is mothballed**
- **BK11 mothballed and for sale**
- **AK6 is Karowe mine – producer of high quality large diamonds**
- **DK1/2 only tailing mining**
- **BK16 a 6 ha kimberlite being evaluated by *Tsodilo Resources* with upside potential**
www.tsodiloresources.com

- December 2015: Ekapa Minerals bought Kimberley mines from De Beers for US\$7.2m
- Ekapa minerals is a consortium vehicle controlled by historically disadvantaged South Africans
- Ekapa Minerals is 50.5% owned by Ekapa Mining, 49.9% Petra Diamonds
- Total carats is 2.8 Mct, possibly increasing with an additional 4.4mct
- Initial production will be at ± 0.7 Mct/a

Kimberley Dumps



De Beers sorting and sales hub moved from London to Gaborone.



Debswana Complex, Gaborone

The Three Dikgosi monument, Gaborone



The Big and Beautiful



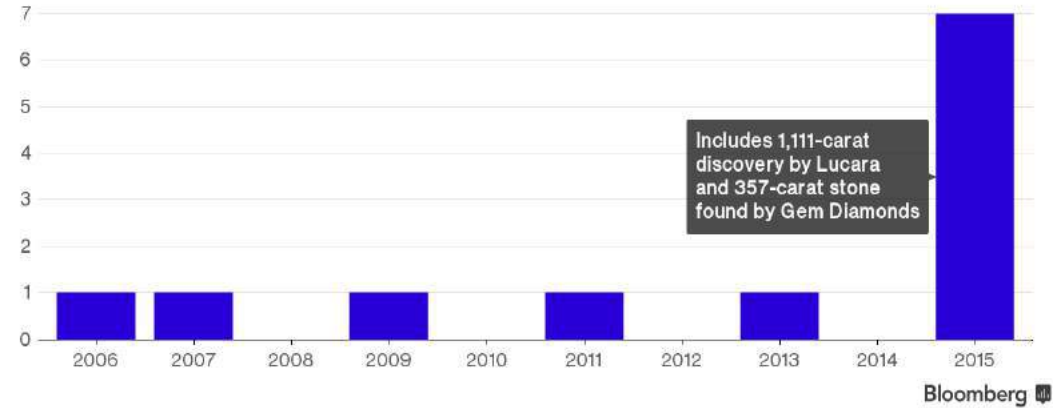
Big is beautiful

Karowe Mine

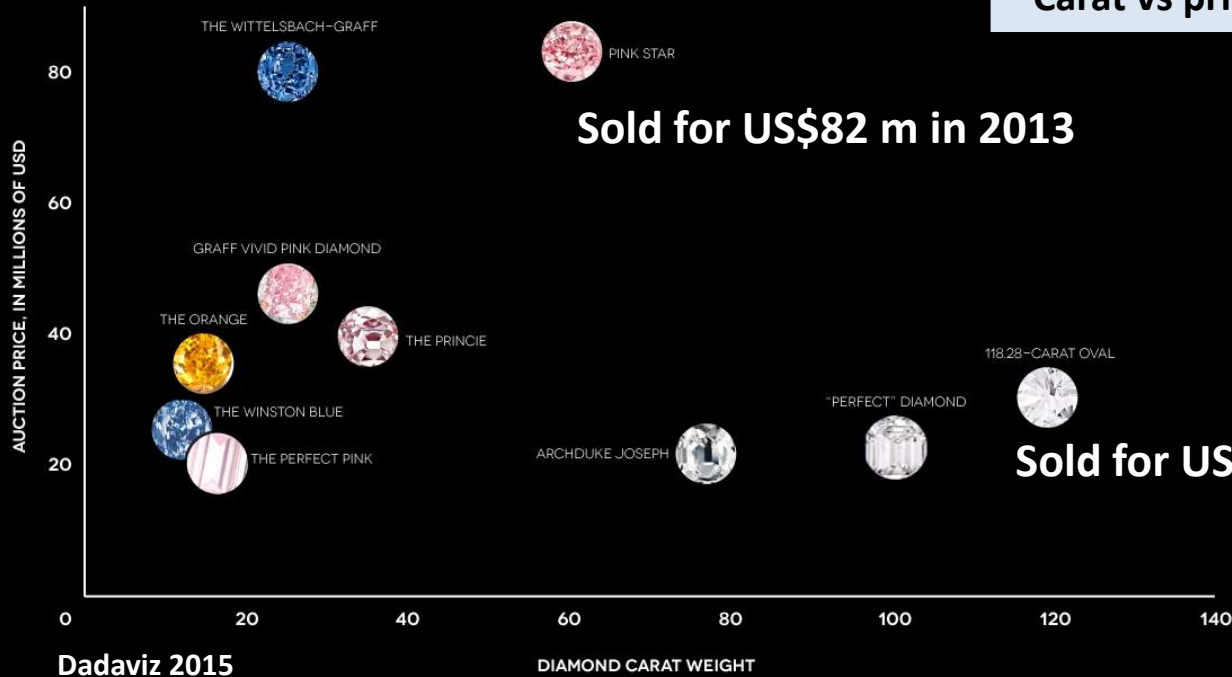
'In the last 17 months, 70 diamonds bigger than 100ct have been recovered, with 12 bigger than 200 ct' (Mining Weekly June 2015)

Unusually Big

Despite the finds by Gem Diamonds and Lucara this year, stones above 250 carats remain rare



Carat vs price

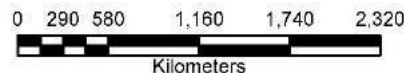
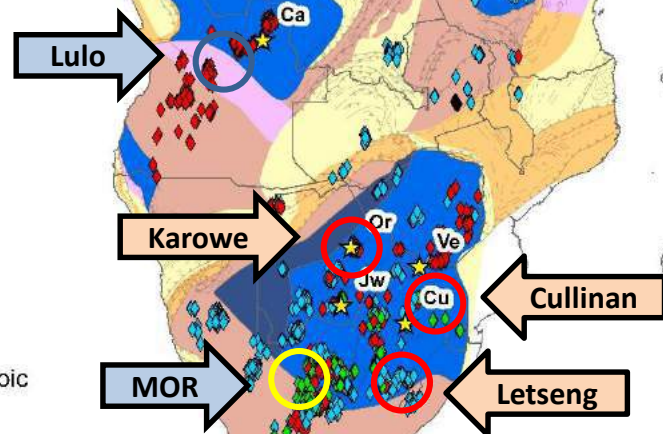




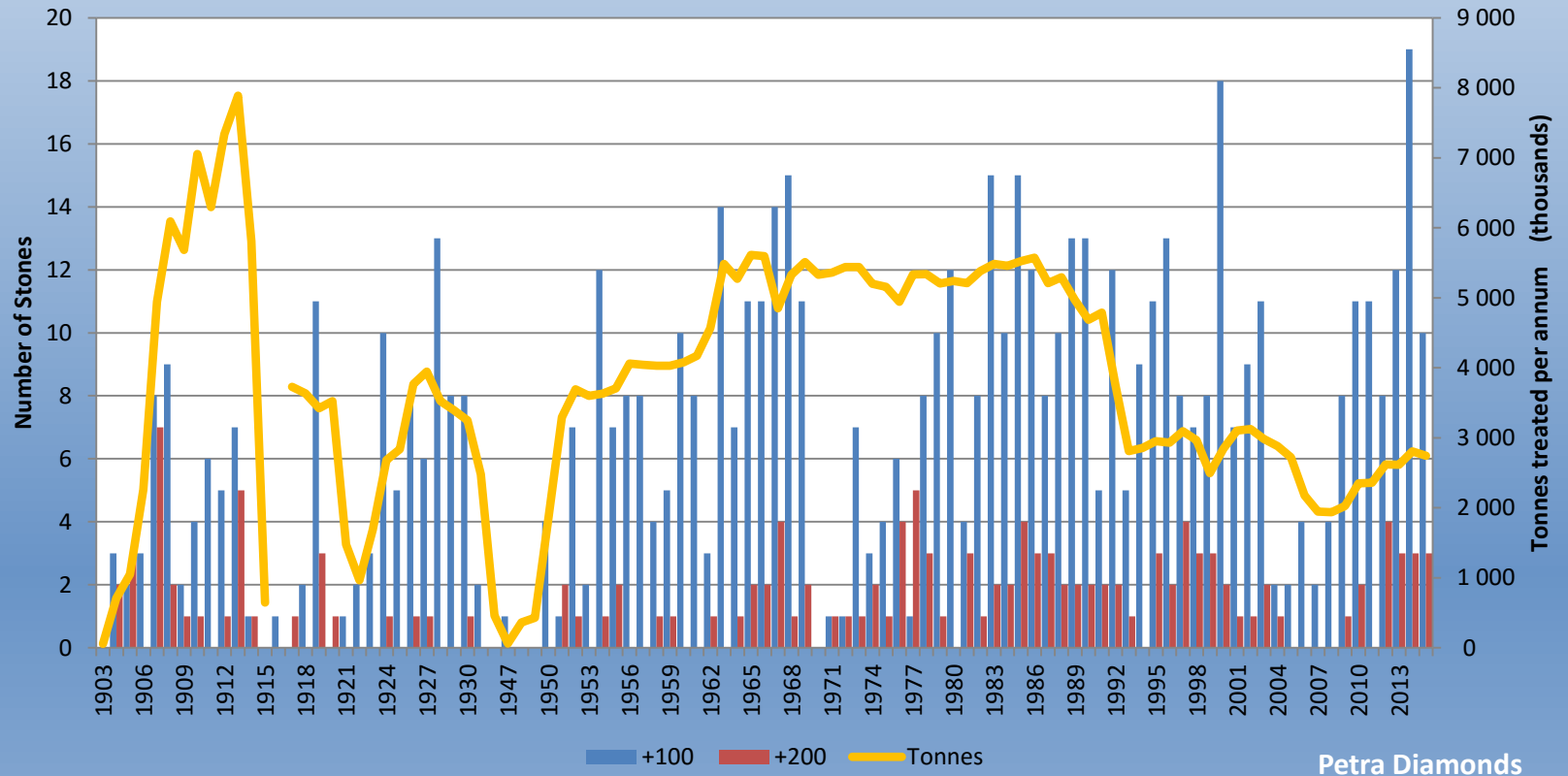
Where some of the big rocks have been found

Legend

-  Kimberlites
-  Group 1
-  Group 2
-  Lamproites
-  Tier-1
-  Neoproterozoic crust
-  Neoproterozoic remobilized Proterozoic
-  Neoproterozoic remobilized Archean
-  Meso- Paleoproterozoic
-  Paleoproterozoic
-  Archean



+100 and +200 Carat stones recovered at Cullinan Diamond Mine



Petra Diamonds

Cullinan:

- Renowned for large diamonds e.g. 3,106 ct Cullinan
- *Has produced a quarter of all the world's diamonds of +400 cts; 138 stones of +200 cts; 802 stones of +100 cts*
- One of the few producers of very rare blue diamond

**Petra Diamonds Ltd
Cullinan mine (SA)**



1939

**Approximate location where the
Cullinan diamond was found**

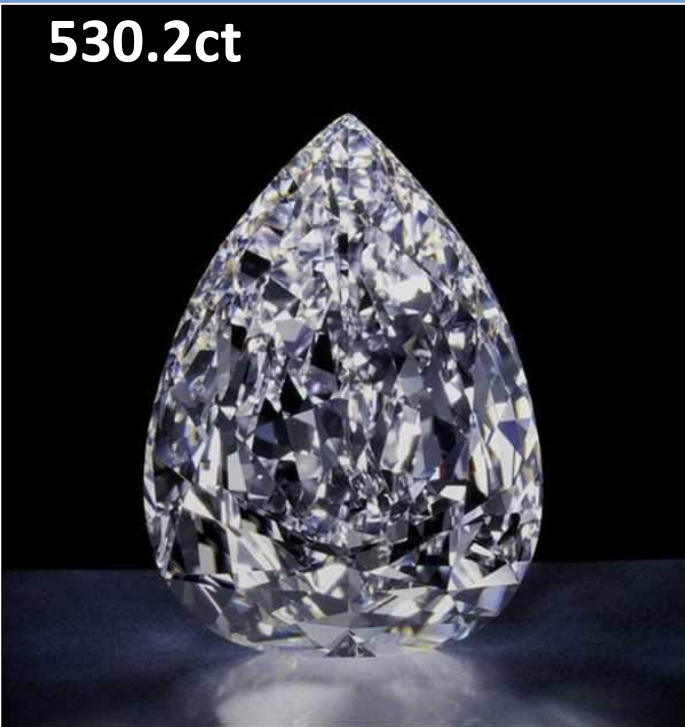


2010

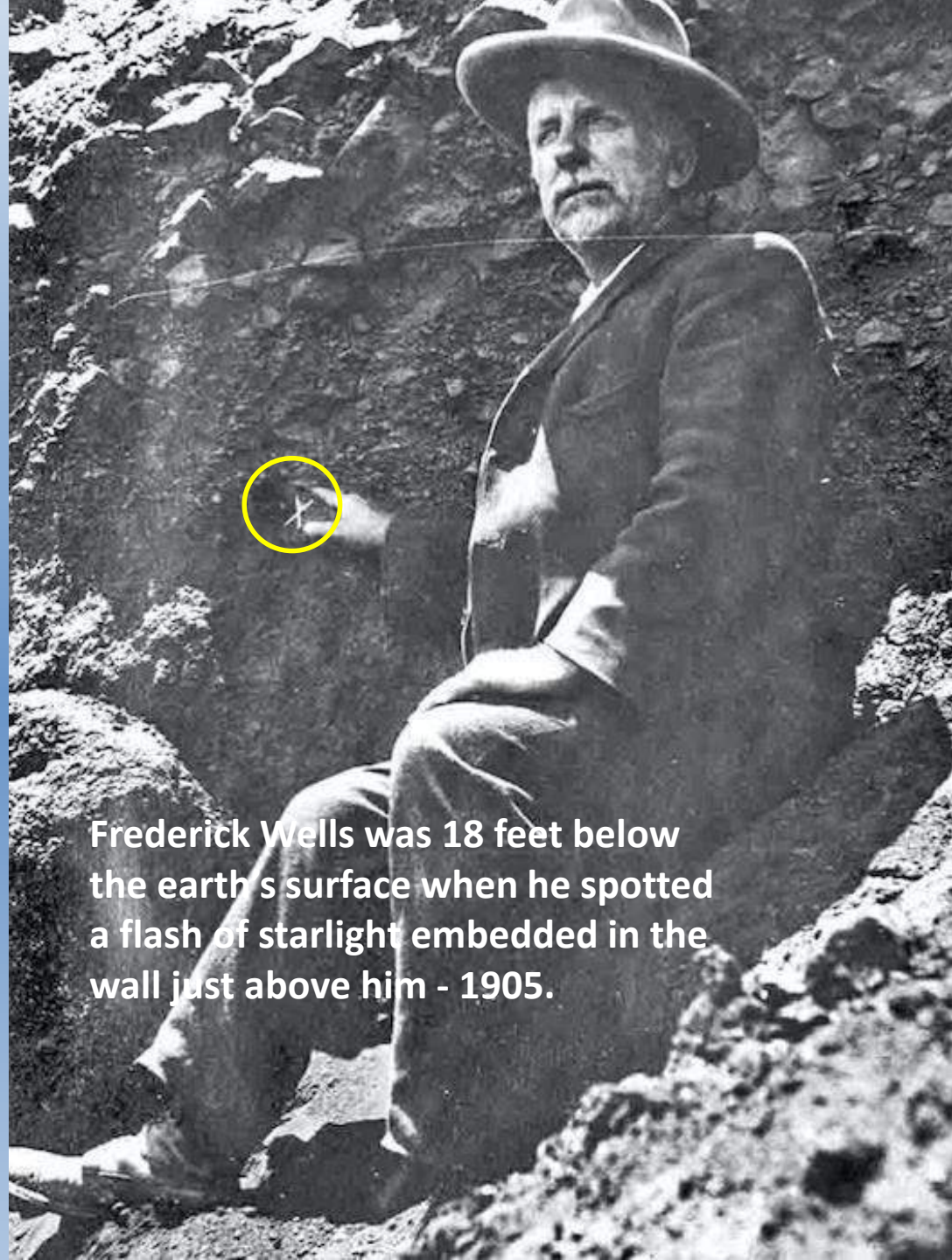




3,106ct



530.2ct



Frederick Wells was 18 feet below the earth's surface when he spotted a flash of starlight embedded in the wall just above him - 1905.

Gem Diamonds Ltd

Letšeng - two pipes with proximal alluvials



PROXIMAL ALLUVIALS

MAIN PIPE
ca. 17 ha

SATELLITE PIPE
ca. 5 ha

PROXIMAL ALLUVIALS



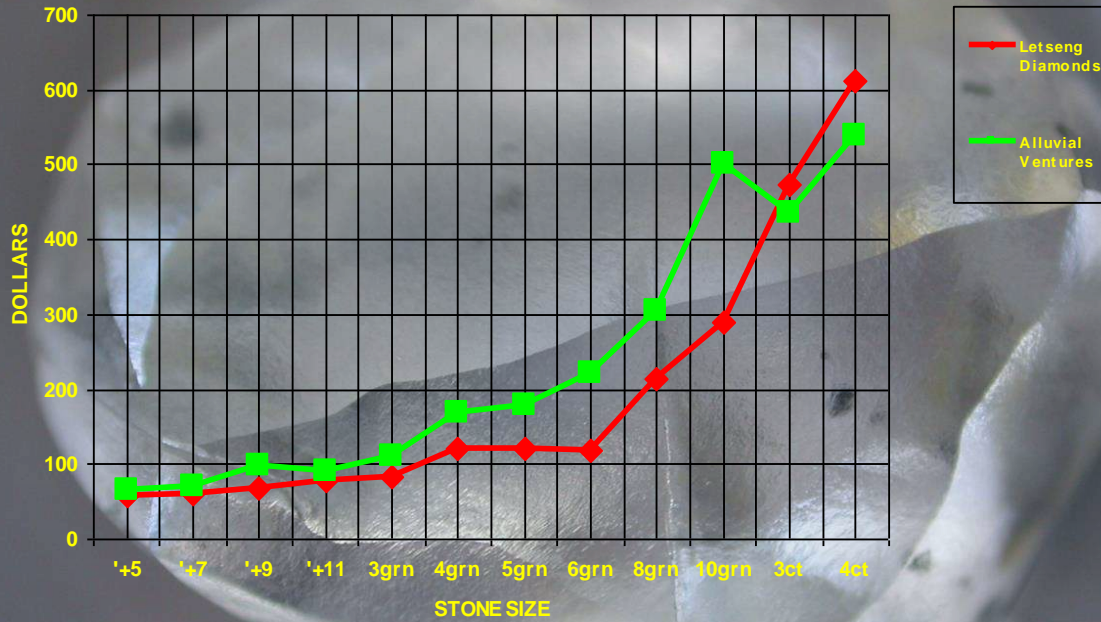
Slide J Ward

171 ct

44

Letšeng: rapid upgrading in proximal alluvials < 1 km

\$ COMPARISON -SATELLITE PIPE VS THE ALLUVIALS



(Source: Whitelock, Ward & Smith, 2004)

357ct (US\$19.3m)



494ct Letseng



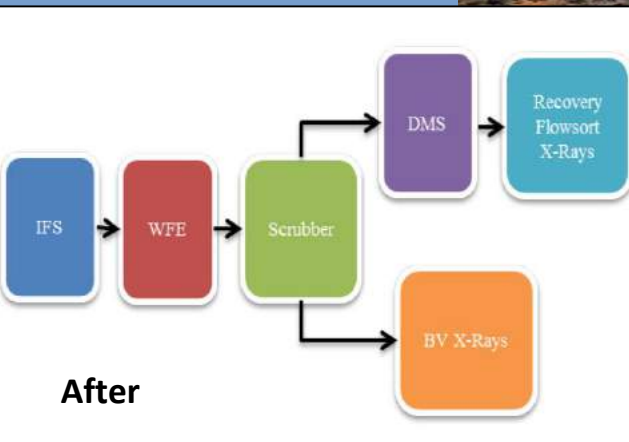
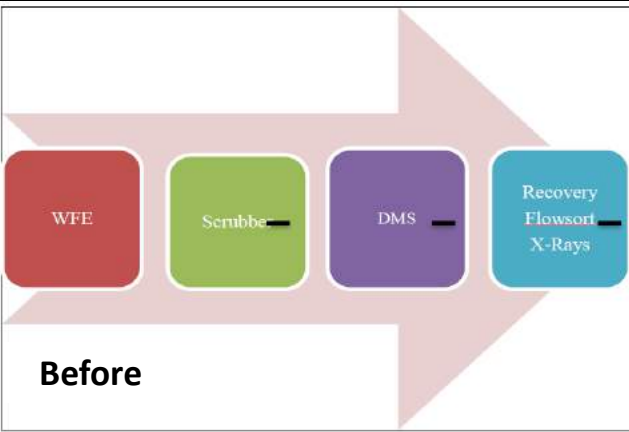
45
Photo D Bowen

Rockwell Diamonds Inc (MOR): Plant upgrade Saxendrift Mine

1. In-field screening

2. Bulk X-ray technology:
Bourestnik

The grade uplift exceeded 40% from the Bulk X-ray (below) compared to a conventional plant – James Campbell (2014).



+6 -15 mm

+15 -35 mm



287 ct



Rockwell Diamonds cont.

Operation	Grade (ct/100m ³)	Processing rate M ³ /Month	Carat value US\$/ct	Unit cost
Saxendrift/ S Ext.	0.45	180,000	2,143	US\$ 9.0m ³
Nieuwejaarskraal	0.55	120,000	1,962	US\$16.5m ³
Saxendrift Hill complex	0.4	-	2,008	US\$ 9.7m ³
Wouterspan	0.62	354,000	2,300	

120.4 ct



Lucapa Diamond Company Luo concession

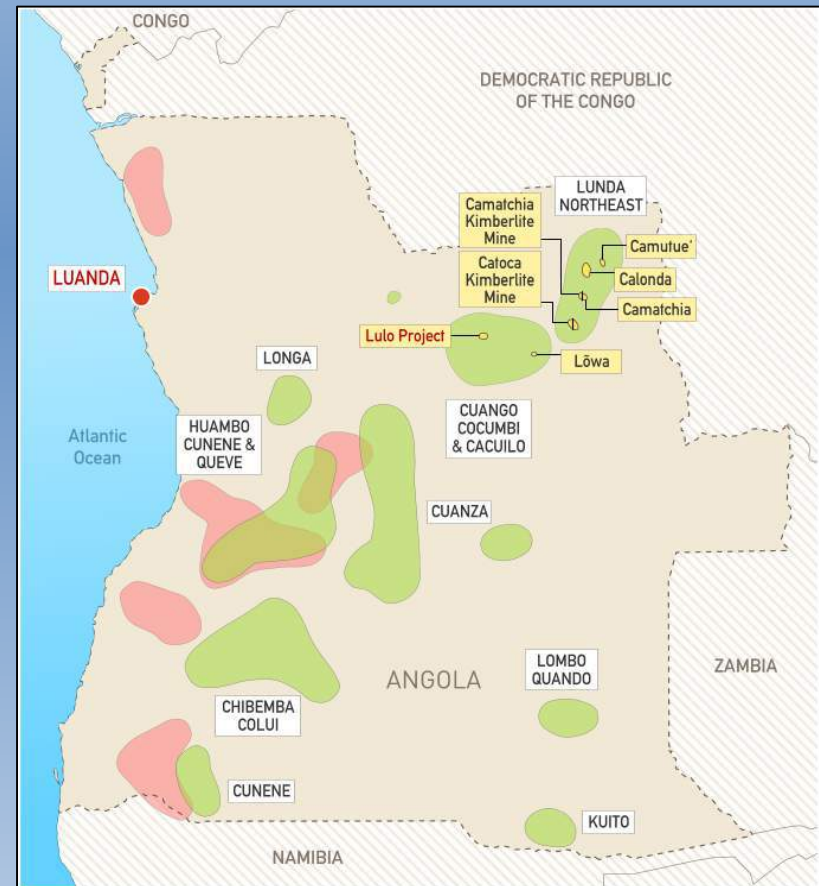


131.4 ct

Up to 22 Feb 2016 (pers. comm Wetherall)

- Recovered 114 specials from 12,000 ct since Jan 2015
- Specials: 30% of wgt but 94% of value
- One parcel tested - 39% type IIa

404.2 ct Type IIa D-colour
Largest diamond ever found in Angola
Feb 2016, recently sold for US\$16m



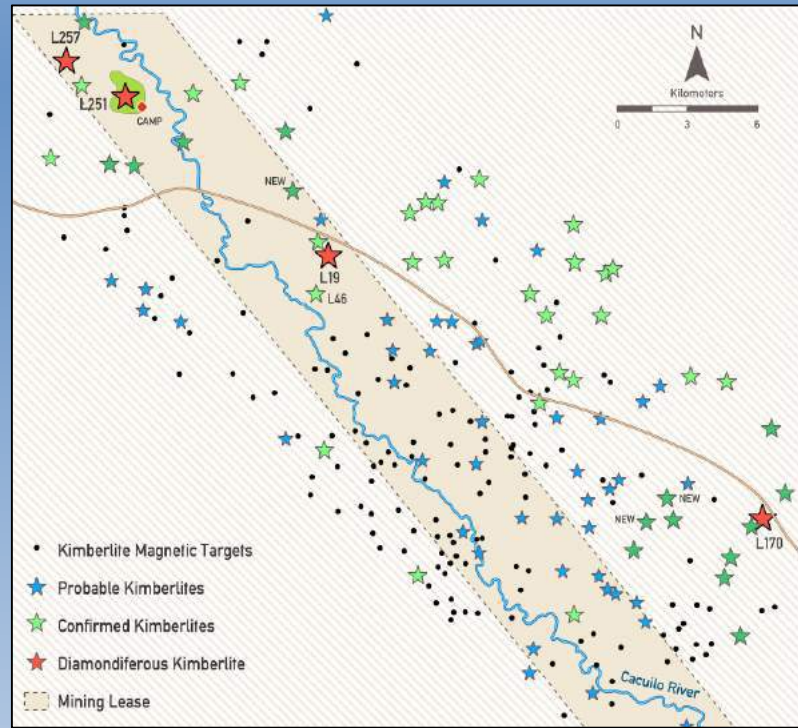


Fancy colours



Run of mine – note pink

- **Specials at a rate of 1 every 1.2 days:**
404 ct, 133 ct, 131 ct, 95.5 ct, 90.3 ct, 86.2 ct,
- **Average stone size 1.2 st/ct**
- **Mining at 40 000 Bulk cubic metres (BCM)**
- **Plant running at 150 tph; +1.5mm -32mm**
- **Final recovery Flow sort**



Concluding remarks

Cullinan – New Plant

1. Replaces 1947 plant.
2. Autogenous AG milling & High Pressure Grinding Rolls (HPGR)
3. XRF recovery units (BVs)
4. Throughput of 6 mpta.

- Footprint decreases from ca. 26 to ca. 5 hectares
- Reduction in number of conveyor belts from 151 (ca. 15km) to 22 (ca. 3km)
- Increase in revenue per tonne
 - $\pm 10\%$ increase in grade due to increased liberation
 - **Improved recoveries of large, higher value stones; less diamond breakage as new plant will utilise gentler processing methods (comminution via attrition) instead of extensive crushing**
 - **Top cut-off 75 mm will cater for +3,000 ct diamonds**
- Lowering of operating cost by R20 – 25/t (savings on energy, water and maintenance requirements)
- Payback of ca. 3 years

New Cullinan Plant

Existing Cullinan Plant



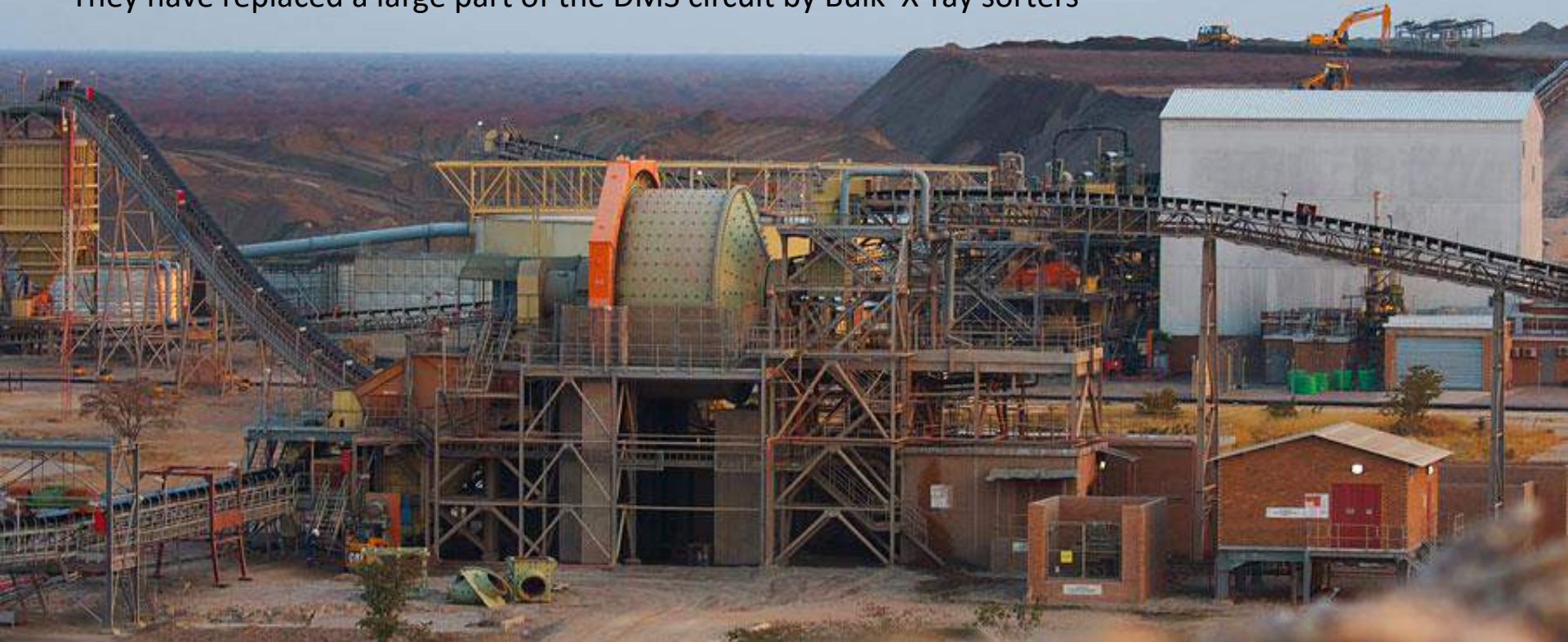
Plant upgrade Karowe Mine (AK06 Kimberlite)

- Autogenous milling
- +60 mm Large Diamond Recovery (XRT)
- 32 – 60 mm Large Diamond Recovery (XRT)
- 8 – 32 mm Bulk sorters (6 Tomra XRT sorters)
- 1.25 – 8 mm DMS



Note:

- Tomra XRT sorters can treat up to 150t/h
- They have replaced a large part of the DMS circuit by Bulk X-ray sorters



Low grade deposits – high value stones (MOR)

- By increasing BCOS to **-4.5 mm**:
 - **65%** fewer stones will be recovered,
 - Only less than **5%** of the value is lost,
 - BUT you can treat 30% more material (-4.5mm fraction constitutes $\pm 33\%$ of the plant feed by mass).
- The introduction of **Bourevestnik (BV) High Tonnage X-Ray units** have caused a complete re-think of the processing circuit. Material of up to 50 mm in diameter can now be treated live.

De Meillon 2014

- Infield screening units
- The production profile was optimized by adjusting the **bottom cut off size** ('BCOS'), eliminating the costly recovery of low value, small diamonds.
- The standard BCOS at Rockwell's MOR operations is a **6 mm**.

Campbell 2014 for
Rockwell



....so back to the beginning.....but things have changed and presently metallurgical changes are driving value.



- **In field screening**
 - No unnecessary transport of undersize and oversize material to the plant and treatment thereof.
- **Crushing**
 - Need suitable crushers for liberating locked up diamonds with minimal diamond breakage (Autogenous milling and High Pressure Grinding Rolls - HPGR)
- **Waste rock sorting -**
 - Remove hard abrasive waste at an early stage - saves wear and tear on the plant.
 - Inter-particle crushing of diamonds is prevented by hard waste removal in between crushing stages.
 - Coarse waste rock is discarded on dumps which are less costly than treating excessive fines in slimes dams.
- **XRT or BV sorting**
 - Large diamonds will be recovered prior to tertiary crushing.
 - The costly DMS process for +4mm kimberlite will be eliminated by sorting the +4mm diamonds directly.
 - All types of diamonds such as low/non luminescent and coated diamonds are detected and recovered by XRT/BV sorters.

(von Ketelhodt 2013)

Thank you

mdewit@tsodiloresources.com



26ct Blue diamond from
Cullinan 'The Star of
Josephine'