INDICES OF THE PHYSICAL VOLUME OF MINING PRODUCTION

No: 2016/3

STATS BRIEF SECOND QUARTER 2016

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1.0 Preface

This statistical release presents quarterly Indices of Mining Production **(IMP)** for the period 2003 to the second quarter of 2016. Also carried in the report is the annual **IMP** for the period 2003 to 2015, derived as the average of the four quarters of the year. This report uses 2013 as a base year.

Stakeholders should note that as a result of editing and revision of data, figures on the previous quarterly stats brief and those on the current brief (for the corresponding period) may differ. Data used in this publication is sourced, on quarterly basis, from the Department of Mines; Ministry of Minerals, Energy and Water Resources.

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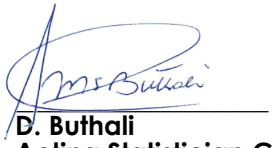
I sincerely thank all stakeholders involved in the formulation of this brief, for their continued support, as we strive to better serve users of our products and services.



D. Buthali
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September 2016

2.0 Summary of Findings

All figures in this report are not seasonally adjusted.

Table 1 presents a summary of findings for Indices of Mining Production **(IMP)** from 2013 to the second quarter of 2016. This table forms the basis of the discussion under Sub-Section 2.1. Reference will however, be made to this table and other tables throughout the report.

Table 1: Key Figures in the Volume of Mining Production

Base Period : 2013=100			
Period	Index of the physical volume of mining production	Year-on-year percentage change	Quarter-on-Quarter percentage change
Q1_2013	82.5	(8.7)	(9.7)
Q2_2013	111.6	25.2	35.3
Q3_2013	97.1	38.4	(12.9)
Q4_2013	108.8	19.1	12.0
Q1_2014	96.2	16.7	(11.5)
Q2_2014	106.6	(4.5)	10.8
Q3_2014	105.7	8.9	(0.8)
Q4_2014	104.5	(4.0)	(1.2)
Q1_2015	95.6	(0.7)	(8.6)
Q2_2015	98.7	(7.4)	3.3
Q3_2015	65.6	(37.9)	(33.5)
Q4_2015	77.9	(25.5)	18.7
Q1_2016	90.0	(5.9)	15.5
Q2_2016	85.9	(13.0)	(4.5)

Note:1. () denotes negative numbers
2. Data for Q1_2016 revised

2.1 Indices of Mining Production

The Index of Mining Production stood at **85.9** in the first quarter of 2016 showing a negative year-on-year decline of 13.0 percent from 98.7 during the 2015 second quarter.

The main contributor to the decline in growth of mining production was Diamond production, having contributed 10.5 percentage points to the decline (**Tables 2** and **6**). It is also notable that all the other minerals, in the exception of Gold production, contributed negatively to the growth in mining production.

Although Gold production registered a positive year-on-year percentage change, its contribution to the overall change in mining production was very minimal, 0.4 of a percentage point. This is as a result of its insignificant weight in the basket of minerals considered, refer to **Table 2**, **Table 5** and **Table 6**).

As compared to the first quarter of 2016, the Index of Mining Production shows a decrease of 4.5 percent from the revised index of 90.0 during the first quarter of 2016 to 85.9 during the second quarter of the same year. It can be seen from **Table 1** that the quarter-on-quarter decrease reflects fluctuating mining production series, owing to unstable economic environment in the world economy.

2.2 Mineral Production

Discussions on mineral production, comparing production during the second quarter of 2016 to the same quarter of 2015 as well as production during the preceding quarter, are based on **Table 4** and **Table 5**. **Table 4** shows quarter-on-quarter percentage changes while year-on-year percentage changes are displayed on **Table 5**.

Diamond production continue to register year-on-year decreases, having declined by 12.1 percent during the second quarter of 2016 as compared to the second quarter of 2015 (**Table 5**). However, when looking at the quarter-on-quarter changes (**Table 4**), diamond production decreased by 2.3 percent during the second quarter of 2016 when compared to production during first quarter of the same year. These decreases in production can be indicative of strained trading conditions leading to the need to decrease production due to low demand.

Copper-Nickel-Cobalt Matte production decreased by 11.2 percent in the second Quarter of 2016 when compared to production during the second quarter of the previous year (**Table 5**). Comparison of production during the second quarter of 2016 and the first quarter of the same year shows a decrease of 21.5 percent (**Table 4**).

Gold production increased by 62.7 percent in the second Quarter of 2016 as compared to the same quarter of 2015. This increase was as a result of higher than expected gold recoveries from the ore. The positive growth is also recognizable when comparing the current quarter and the previous quarter reflecting an increase of 34.8 percent.

Soda Ash production declined by 13.3 percent in the second quarter of 2016 when compared to production during 2015 second quarter. Production during 2016 second quarter gives a decrease of 28.8 percent when compared to production during the first quarter of the same year. This could be attributed to the need to reduce production as a result of the low demand of the commodity.

Salt production declined by 7.5 percent during the second quarter of 2016 when compared to production during 2015 second quarter. Comparison of production during the second quarter of 2016 and the previous quarter shows a decline of 16.0 percent.

Coal production decreased by 30.5 percent in the second quarter of 2016 as compared to the corresponding quarter of 2015. Comparison of the second quarter of 2016 and the first quarter of the same year gives a decline of 18.0 percent. The decrease was largely attributable to the weak domestic demand owing to operational challenges experienced during the second quarter of 2016 at the Morupule B Power Plant. The low export prices of the commodity also contributed to the decrease on production.

Silver and Copper in Concentrates recorded zero production during the period under review and for the preceding quarter. This is as a result of the provisional liquidation of the concerned companies which necessitated halting of production at the respective mines.

Table 2: Index of Mining Production for the latest Quarter by Mineral Groups and Minerals

Base:2013=100					
Mineral	Weights (2013)	April – June 2015	April – June 2016	Year-on-Year Percentage Change	Contribution (% points) to the Percentage Change in the total Mining Production
Diamonds	**82.5**	104.1	91.5	(12.1)	(10.5)
Copper-Nickel-Cobalt Matte	**8.6**	105.2	93.4	(11.2)	(1.0)
Copper in Concentrates	**5.5**	30.3	n.a	(100.0)	(1.7)
Gold	**1.4**	49.7	80.9	62.7	0.4
Soda Ash	**0.9**	96.9	84.0	(13.3)	(0.1)
Salt	**0.5**	61.1	56.5	(7.5)	(0.0)
Silver	**0.4**	n.a	n.a	(100.0)	(0.0)
Coal	**0.3**	135.1	93.9	(30.5)	(0.1)
Total	**100**	**98.7**	**85.9**	**(13.0)**	**(13.0)**

Note: 1. The contribution (percentage points) of a mineral to the percentage change in the total mining production is calculated by multiplying the difference in the index for the mineral by the weight of the mineral and then dividing by the previous period's total index.
2. () denotes negative numbers

Table 3: Index of the Volume of Mining Production by Mineral Group and Mineral

	Base 2013 = 100								
	Diamonds	Copper-Nickel Cobalt Matte	Copper in concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2003	131.3	117.1	n.a.	n.a.	102.8	44.0	n.a.	55.0	**119.6**
2004	134.2	99.4	n.a.	n.a.	116.1	41.6	n.a.	60.9	**120.6**
2005	137.6	133.7	n.a.	268.1	123.7	38.2	n.a.	65.8	**130.1**
2006	148.2	126.6	n.a.	250.4	104.8	1.2	n.a.	64.3	**137.9**
2007	145.4	111.4	n.a.	220.0	122.7	50.4	n.a.	55.4	**134.0**
2008	140.9	118.1	n.a.	263.2	115.6	32.8	n.a.	60.8	**131.3**
2009	76.7	121.1	n.a.	134.7	93.0	46.3	n.a.	49.3	**76.7**
2010	95.2	110.7	12.5	147.0	105.7	70.0	n.a.	66.1	**92.2**
2011	99.0	71.9	22.1	129.4	113.1	85.7	n.a.	52.7	**92.4**
2012	89.1	80.5	31.1	114.1	109.1	70.5	n.a.	97.2	**85.3**
2013	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	**100.0**
2014	106.6	67.1	114.0	79.4	117.8	98.9	98.6	114.4	**103.3**
2015	90.0	69.8	32.7	62.4	95.8	71.7	12.4	138.1	**84.5**
2003 Q1	102.3	67.7	n.a.	n.a.	98.4	40.3	n.a.	51.6	**91.3**
Q2	134.6	143.4	n.a.	n.a.	111.0	50.4	n.a.	61.6	**124.7**
Q3	149.6	137.2	n.a.	n.a.	103.7	50.3	n.a.	59.8	**136.5**
Q4	138.7	120.0	n.a.	n.a.	97.9	35.1	n.a.	47.0	**125.8**
2004 Q1	99.9	133.3	n.a.	n.a.	90.3	39.2	n.a.	55.2	**95.0**
Q2	108.5	78.6	n.a.	n.a.	102.7	49.4	n.a.	60.7	**97.5**
Q3	166.1	43.8	n.a.	n.a.	128.8	37.9	n.a.	61.7	**142.3**
Q4	162.1	142.0	n.a.	n.a.	142.8	39.9	n.a.	66.0	**147.5**
2005 Q1	123.0	142.5	n.a.	304.3	132.7	43.2	n.a.	64.6	**119.5**
Q2	141.2	133.1	n.a.	352.6	108.7	35.1	n.a.	60.8	**134.0**
Q3	141.0	135.5	n.a.	215.4	130.7	36.9	n.a.	66.1	**132.4**
Q4	145.3	123.8	n.a.	200.1	122.8	37.5	n.a.	71.9	**134.7**
2006 Q1	143.8	115.5	n.a.	230.7	74.9	29.7	n.a.	66.9	**132.7**
Q2	136.8	131.1	n.a.	261.9	113.7	46.8	n.a.	67.4	**129.1**
Q3	154.1	136.1	n.a.	260.2	138.6	56.4	n.a.	59.9	**144.0**
Q4	158.3	123.8	n.a.	248.6	92.2	31.9	n.a.	63.2	**145.8**

Table 3 continued: Index of the Volume of Mining Production by Mineral Group and Mineral

	Base 2013 = 100								
	Diamonds	Copper-Nickel Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2007 Q1	141.9	123.6	n.a.	174.0	100.4	14.8	n.a.	59.4	**131.2**
Q2	141.8	128.2	n.a.	249.6	122.4	56.4	n.a.	56.0	**133.0**
Q3	157.8	44.9	n.a.	228.4	147.3	70.3	n.a.	57.5	**139.0**
Q4	140.1	149.1	n.a.	228.1	120.6	60.1	n.a.	48.7	**133.0**
2008 Q1	140.7	130.0	n.a.	217	113.8	31.3	n.a.	61.3	**131.6**
Q2	138.9	111.2	n.a.	257.6	100.7	21.1	n.a.	59.3	**128.8**
Q3	158.0	124.3	n.a.	266.4	123.5	44.3	n.a.	62.0	**146.2**
Q4	126.0	106.8	n.a.	311.7	124.5	34.5	n.a.	60.7	**118.8**
2009 Q1	n.a	92.5	n.a.	140.2	86.7	43.4	n.a.	58.7	**11.0**
Q2	67.7	131.0	n.a.	155.5	67.4	32.6	n.a.	50.2	**70.1**
Q3	101.3	136.9	n.a.	133.8	116.8	43.5	n.a.	45.6	**98.5**
Q4	137.7	123.9	n.a.	109.4	101.2	65.5	n.a.	42.8	**127**
2010 Q1	79.4	127.4	6.1	134.7	103.7	58.5	n.a.	63.4	**80.0**
Q2	98.1	81.8	10.5	135.0	91.2	56.7	n.a.	63.8	**91.6**
Q3	103.5	134.1	16.8	160.9	109.8	95.8	n.a.	71.9	**101.7**
Q4	99.7	99.7	18.6	157.6	118	68.9	n.a.	65.2	**95.5**
2011 Q1	93.3	95.2	15.7	111.1	98.7	71.8	n.a.	55.6	**88.9**
Q2	102.5	85.9	23.8	111.8	101.6	69.5	n.a.	72.4	**96.2**
Q3	119.8	7.2	25.8	134.3	130.9	106.5	n.a.	56.9	**104.6**
Q4	80.3	99.3	23.1	160.4	121.4	94.7	n.a.	25.8	**79.9**
2012 Q1	92.5	110.1	23.8	134.6	105.9	65.8	n.a.	62.6	**90.3**
Q2	92.4	99.6	22.9	119.8	99.2	78.3	n.a.	60.1	**89.1**
Q3	75.8	25.6	41.0	108.9	129.1	58.2	n.a.	118.8	**70.2**
Q4	95.7	86.9	36.6	93.1	102.1	79.9	n.a.	147.4	**91.4**
2013 Q1	80.5	88.0	94.0	76.6	122.9	97.0	102.3	107.5	**82.5**
Q2	111.7	112.4	115.5	98.5	89.0	116.8	118.1	74.6	**111.6**
Q3	95.8	107.8	93.2	102.4	112.9	118.6	108.0	113.8	**97.1**
Q4	111.9	91.9	97.4	122.5	75.2	67.6	71.7	104.1	**108.8**
2014 Q1	101.5	46.8	96.9	96.4	109.0	68.6	73.2	95.0	**96.2**
Q2	110.0	73.4	114.7	74.3	115.6	100.8	88.5	123.9	**106.6**
Q3	109.3	51.6	136.0	84.5	117.3	116.2	135.4	130.6	**105.7**
Q4	105.5	96.5	108.5	62.3	129.5	109.7	97.5	108.3	**104.5**
2015 Q1	99.1	87.6	74.3	51.7	73.4	61.6	49.6	126.9	**95.6**
Q2	104.1	105.2	30.3	49.7	96.9	61.6	n.a	135.1	**98.7**
Q3	72.7	19.8	14.7	77.9	125.6	106.6	n.a	154.8	**65.6**
Q4	84.0	66.6	n.a	70.3	131.2	80.9	n.a	135.6	**77.9**
2016 Q1	93.7	119.0	n.a	60.0	117.9	67.3	n.a	114.4	**90.0**
Q2	91.5	93.4	n.a	80.9	84.0	56.5	n.a	93.9	**85.9**

Note: 1. 2016 Figures are provisional
2. n.a signifies data not available/no production at the specified period,

Table 4: Quarter on Quarter Percentage Change in the Volume of Mining Production by Mineral Group and Mineral

Base 2013 = 100									
	Diamonds	Copper-Nickel Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Year/Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2003 Q2	31.6	111.7	n.a	n.a	12.8	25.1	n.a	19.3	**36.5**
Q3	11.2	(4.3)	n.a	n.a	(6.5)	(0.4)	n.a	(2.9)	**9.5**
Q4	(7.3)	(12.5)	n.a	n.a	(5.6)	(30.2)	n.a	(21.5)	**(7.8)**
2004 Q1	(27.9)	11.0	n.a	n.a	(7.8)	11.7	n.a	17.4	**(24.5)**
Q2	8.5	(41.0)	n.a	n.a	13.7	26.0	n.a	10.1	**2.7**
Q3	53.2	(44.2)	n.a	n.a	25.4	(23.3)	n.a	1.6	**45.9**
Q4	(2.4)	224.1	n.a	n.a	10.9	5.4	n.a	6.9	**3.7**
2005 Q1	(24.1)	0.4	n.a	n.a	(7.1)	8.3	n.a	(2.2)	**(19.0)**
Q2	14.8	(6.6)	n.a	15.9	(18.0)	(18.9)	n.a	(5.8)	**12.2**
Q3	(0.1)	1.8	n.a	(38.9)	20.2	5.1	n.a	8.6	**(1.2)**
Q4	3.0	(8.7)	n.a	(7.1)	(6.1)	1.7	n.a	8.7	**1.7**
2006 Q1	(1.0)	(6.7)	n.a	15.3	(39.0)	(20.7)	n.a	(6.9)	**(1.5)**
Q2	(4.9)	13.5	n.a	13.5	51.9	57.5	n.a	0.6	**(2.7)**
Q3	12.6	3.8	n.a	(0.6)	21.9	20.4	n.a	(11.0)	**11.6**
Q4	2.7	(9.1)	n.a	(4.5)	(33.5)	(43.4)	n.a	5.4	**1.2**
2007 Q1	(10.3)	(0.1)	n.a	(30.0)	8.9	(53.7)	n.a	(6.0)	**(10.0)**
Q2	(0.0)	3.7	n.a	43.4	21.9	282.2	n.a	(5.8)	**1.4**
Q3	11.3	(65.0)	n.a	(8.5)	20.4	24.6	n.a	2.7	**4.6**
Q4	(11.3)	232.1	n.a	(0.1)	(18.1)	(14.5)	n.a	(15.3)	**(4.4)**
2008 Q1	0.5	(12.8)	n.a	(4.9)	(5.7)	(48.0)	n.a	25.8	**(1.0)**
Q2	(1.3)	(14.4)	n.a	18.7	(11.5)	(32.5)	n.a	(3.2)	**(2.1)**
Q3	13.8	11.7	n.a	3.4	22.6	109.9	n.a	4.5	**13.5**
Q4	(20.3)	(14.0)	n.a	17.0	0.8	(22.0)	n.a	(2.1)	**(18.7)**
2009 Q1	(100.0)	(13.4)	n.a	(55.0)	(30.4)	25.6	n.a	(3.2)	**(90.7)**
Q2	67.7	41.6	n.a	10.9	(22.3)	(24.8)	n.a	(14.5)	**536.3**
Q3	49.6	4.5	n.a	(14.0)	73.3	33.3	n.a	(9.1)	**40.5**
Q4	36.0	(9.5)	n.a	(18.2)	(13.3)	50.7	n.a	(6.2)	**29.0**
2010 Q1	(42.3)	2.8	n.a	23.1	2.5	(10.7)	n.a	48.1	**(37.0)**
Q2	23.4	(35.8)	72.5	0.2	(12.0)	(3.0)	n.a	0.7	**14.4**
Q3	5.6	63.9	60.2	19.2	20.4	68.8	n.a	12.6	**11.0**
Q4	(3.7)	(25.6)	10.4	(2.0)	7.4	(28.1)	n.a	(9.3)	**(6.0)**
2011 Q1	(6.4)	(4.5)	(15.2)	(29.5)	(16.3)	4.3	n.a	(14.8)	**(6.9)**
Q2	9.8	(9.8)	51.2	0.6	2.9	(3.3)	n.a	30.3	**8.2**
Q3	16.9	(91.6)	8.2	20.1	28.8	53.3	n.a	(21.4)	**8.7**
Q4	(32.9)	1,278.1	(10.2)	19.4	(7.3)	(11.1)	n.a	(54.6)	**(23.6)**

Table 4 continued: Quarter on Quarter Percentage Change in the Volume of Mining Production by Mineral Group and Mineral

	Base 2013 = 100								
	Diamonds	Copper-Nickel Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Year/Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2012 Q1	15.2	10.8	3.0	(16.0)	(12.7)	(30.6)	n.a	142.7	**13.0**
Q2	(0.1)	(9.5)	(4.0)	(11.0)	(6.3)	18.9	n.a	(4.0)	**(1.3)**
Q3	(18.0)	(74.3)	79.1	(9.1)	30.1	(25.6)	n.a	97.7	**(21.2)**
Q4	26.3	239.3	(10.6)	(14.5)	(21.0)	37.3	n.a	24.0	**30.2**
2013 Q1	(15.9)	1.3	156.6	(17.7)	20.5	21.4	n.a	(27.1)	**(9.7)**
Q2	38.7	27.7	22.9	28.6	(27.6)	20.4	15.5	(30.6)	**35.3**
Q3	(14.3)	(4.1)	(19.3)	4.0	26.8	1.5	(8.6)	52.6	**(12.9)**
Q4	16.8	(14.7)	4.5	19.6	(33.4)	(43.0)	(33.6)	(8.6)	**12.0**
2014 Q1	(9.3)	(49.1)	(0.5)	(21.4)	44.9	1.5	2.1	(8.7)	**(11.5)**
Q2	8.4	56.9	18.3	(22.9)	6.0	47.0	20.8	30.5	**10.8**
Q3	(0.7)	(29.7)	18.6	13.8	1.5	15.3	53.0	5.4	**(0.8)**
Q4	(3.4)	86.8	(20.3)	(26.3)	10.4	(5.6)	(28.0)	(17.1)	**(1.2)**
2015 Q1	(6.0)	(9.2)	(31.5)	(17.0)	(43.3)	(43.9)	(49.1)	17.2	**(8.6)**
Q2	5.0	20.1	(59.2)	(3.8)	31.9	(0.7)	(100.0)	6.4	**3.3**
Q3	(30.1)	(81.1)	(51.7)	56.7	29.6	74.4	(100.0)	14.6	**(33.5)**
Q4	15.5	235.3	(100.0)	(9.7)	4.5	(24.1)	(100.0)	(12.4)	**18.7**
2016 Q1	11.5	78.7	(100.0)	(14.7)	(10.1)	(16.9)	(100.0)	(15.6)	**15.5**
Q2	(2.3)	(21.5)	(100.0)	34.8	(28.8)	(16.0)	(100.0)	(18.0)	**(4.5)**

Note: 1. () denote negative numbers
2. n.a signifies data not available/no production at the specified period

Table 5: Year-on-Year Percentage Change in the Volume of Mining Production by Mineral Group and Mineral

	Diamonds	Copper-Nickel Cobalt Matte	Copper in concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2004	2.2	(15.1)	n.a.	n.a.	13.0	(5.5)	n.a.	10.7	**0.8**
2005	2.6	34.5	n.a.	...	6.5	(8.2)	n.a.	8.1	**7.9**
2006	7.7	(5.3)	n.a.	(6.6)	(15.3)	8.0	n.a.	(2.3)	**6.0**
2007	(1.9)	(12.0)	n.a.	(12.1)	17.0	22.3	n.a.	(14.0)	**(2.8)**
2008	(3.1)	6.0	n.a.	19.6	(5.7)	(34.9)	n.a.	9.8	**(2.0)**
2009	(45.6)	2.5	n.a.	(48.8)	(19.6)	41.0	n.a.	(18.9)	**(41.6)**
2010	24.2	(8.5)	n.a.	9.1	13.6	51.3	n.a.	33.9	**20.2**
2011	4.0	(35.1)	76.5	(12.0)	7.0	22.4	n.a.	(20.3)	**0.2**
2012	(10.0)	12.0	40.6	(11.8)	(3.6)	(17.6)	n.a.	84.7	**(7.7)**
2013	12.2	24.2	221.9	(12.4)	(8.3)	41.8	...	2.8	**17.3**
2014	6.6	(32.9)	14.0	(20.6)	17.8	(1.1)	(1.4)	14.4	**3.3**
2015	(15.6)	4.1	(71.3)	(21.4)	(18.7)	(27.4)	(87.4)	20.7	**(18.2)**
2004 Q1	(2.3)	96.8	n.a.	...	(8.3)	(2.8)	n.a.	6.8	**4.0**
Q2	(19.4)	(45.2)	n.a.	...	(7.5)	(2.1)	n.a.	(1.4)	**(21.8)**
Q3	11.0	(68.1)	n.a.	...	24.2	(24.6)	n.a.	(3.2)	**4.2**
Q4	16.9	18.3	n.a.	...	45.8	13.8	n.a.	40.5	**17.2**
2005 Q1	23.1	7.0	n.a.	...	46.9	10.3	n.a.	17.1	**25.8**
Q2	30.1	69.3	n.a.	...	5.9	(29.0)	n.a.	0.2	**37.5**
Q3	(15.1)	209.2	n.a.	...	1.5	(2.7)	n.a.	7.1	**(6.9)**
Q4	(10.4)	(12.9)	n.a.	...	(14.0)	(6.1)	n.a.	8.9	**(8.7)**
2006 Q1	16.9	(19.0)	n.a.	(24.2)	(43.6)	(31.2)	n.a.	3.7	**11.1**
Q2	(3.1)	(1.5)	n.a.	(25.7)	4.6	33.5	n.a.	10.7	**(3.7)**
Q3	9.3	0.5	n.a.	20.8	6.0	53.0	n.a.	(9.3)	**8.8**
Q4	9.0	0.0	n.a.	24.2	(24.9)	(14.8)	n.a.	(12.1)	**8.2**
2007 Q1	(1.3)	7.0	n.a.	(24.6)	34.1	(50.3)	n.a.	(11.3)	**(1.2)**
Q2	3.7	(2.2)	n.a.	(4.7)	7.7	20.6	n.a.	(16.9)	**3.0**
Q3	2.4	(67.0)	n.a.	(12.2)	6.3	24.8	n.a.	(4.1)	**(3.5)**
Q4	(11.5)	20.4	n.a.	(8.3)	30.8	88.3	n.a.	(22.9)	**(8.8)**

Table 5 continued: Year-on-Year Percentage Change in the Volume of Mining Production by Mineral Group and Mineral (Base 2013 =100)

	Diamonds	Copper-Nickel Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Year/Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2008 Q1	(0.8)	5.2	n.a.	24.7	13.4	111.8	n.a.	3.2	**0.3**
Q2	(2.1)	(13.2)	n.a.	3.2	(17.7)	(62.6)	n.a.	6.0	**(3.1)**
Q3	0.1	176.9	n.a.	16.6	(16.2)	(37.0)	n.a.	7.9	**5.1**
Q4	(10.0)	(28.3)	n.a.	36.7	3.2	(42.6)	n.a.	24.6	**(10.6)**
2009 Q1	(100.0)	(28.9)	n.a.	(35.4)	(23.8)	38.7	n.a.	(4.1)	**(91.6)**
Q2	(51.3)	17.7	n.a.	(39.6)	(33.1)	54.6	n.a.	(15.4)	**(45.6)**
Q3	(35.9)	10.2	n.a.	(49.8)	(5.5)	(1.8)	n.a.	(26.4)	**(32.6)**
Q4	9.3	16.0	n.a.	(64.9)	(18.7)	89.8	n.a.	(29.5)	**6.9**
2010 Q1	...	37.8	...	(3.9)	19.6	34.8	n.a.	7.9	**626.4**
Q2	44.9	(37.5)	...	(13.2)	35.4	73.9	n.a.	27.2	**30.6**
Q3	2.2	(2.1)	...	20.2	(5.9)	120.3	n.a.	57.6	**3.2**
Q4	(27.6)	(21.8)	...	44.0	16.6	5.1	n.a.	52.4	**(24.8)**
2011 Q1	17.5	(25.3)	158.6	(17.5)	(4.8)	22.8	n.a.	(12.3)	**11.1**
Q2	4.5	5.0	126.7	(17.2)	11.3	22.5	n.a.	13.4	**5.0**
Q3	15.8	(94.6)	53.2	(16.5)	19.1	11.3	n.a.	(20.9)	**2.9**
Q4	(19.4)	(0.4)	24.6	1.7	2.8	37.5	n.a.	(60.4)	**(16.4)**
2012 Q1	(0.8)	15.6	51.4	21.1	7.3	(8.4)	n.a.	12.7	**1.6**
Q2	(9.8)	15.9	(3.9)	7.2	(2.3)	12.6	n.a.	(17.0)	**(7.3)**
Q3	(36.7)	255.4	59.1	(18.9)	(1.3)	(45.4)	n.a.	109.0	**(32.9)**
Q4	19.2	(12.5)	58.4	(42.0)	(15.9)	(15.6)	n.a.	471.1	**14.4**
2013 Q1	(13.0)	(20.1)	294.5	(43.1)	16.1	47.4	...	71.6	**(8.7)**
Q2	20.9	12.8	405.1	(17.8)	(10.3)	49.3	...	24.1	**25.2**
Q3	26.4	320.7	127.4	(5.9)	(12.6)	103.7	...	(4.2)	**38.4**
Q4	16.9	5.7	165.9	31.6	(26.3)	(15.4)	...	(29.4)	**19.1**
2014 Q1	26.0	(46.8)	3.1	25.8	(11.4)	(29.3)	(28.4)	(11.7)	**16.7**
Q2	(1.5)	(34.7)	(0.7)	(24.6)	29.8	(13.7)	(25.1)	66.1	**(4.5)**
Q3	14.1	(52.1)	46.0	(17.5)	3.9	(2.0)	25.4	14.7	**8.9**
Q4	(5.7)	5.0	11.4	(49.1)	72.2	62.3	35.9	4.0	**(4.0)**
2015 Q1	(2.3)	87.3	(23.3)	(46.3)	(32.6)	(10.3)	(32.3)	33.7	**(0.7)**
Q2	(5.4)	43.3	(73.5)	(33.0)	(16.2)	(39.4)	(100.0)	9.0	**(7.4)**
Q3	(33.4)	(61.5)	(89.2)	(7.8)	7.1	(8.3)	(100.0)	18.6	**(37.9)**
Q4	(20.4)	(31.0)	(100.0)	12.9	1.4	(26.2)	(100.0)	25.3	**(25.5)**
2016 Q1	(5.3)	35.8	(100.0)	16.0	67.3	14.8	(100.0)	(9.8)	**(5.6)**
Q2	(12.1)	(11.2)	(100.0)	62.7	(13.3)	(7.5)	(100.0)	(30.5)	**(13.0)**

Note: 1. () denote negative numbers
2. ...data is not zero but the figure is not significant enough to be measured

Table 6: Contribution of Each Mineral Group and Mineral to the Year-on-Year Percentage Change in the Volume of Mining Production (Base 2013 =100)

	Diamonds	Copper-Nickel Cobalt Matte	Copper in concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2004	2.0	(1.3)	n.a.	...	0.1	(0.0)	n.a.	0.0	**0.8**
2005	2.4	2.4	n.a.	...	0.1	(0.0)	n.a.	0.0	**7.9**
2006	6.7	(0.5)	n.a.	(0.2)	(0.1)	0.0	n.a.	(0.0)	**6.0**
2007	(1.7)	(0.9)	n.a.	(0.3)	0.1	0.0	n.a.	(0.0)	**(2.8)**
2008	(2.8)	0.4	n.a.	0.4	(0.0)	(0.1)	n.a.	0.0	**(2.0)**
2009	(40.3)	0.2	n.a.	(1.4)	(0.2)	0.0	n.a.	(0.0)	**(41.6)**
2010	19.9	(1.2)	...	0.2	0.1	0.2	n.a.	0.1	**20.2**
2011	3.4	(3.6)	0.6.	(0.3)	0.1	0.1	n.a.	(0.0)	**0.2**
2012	(8.8)	0.8	0.5.	(0.2)	(0.0)	(0.1)	n.a.	0.1	**(7.7)**
2013	10.5	2.0	4.4	(0.2)	(0.1)	0.2	...	0.0	**17.3**
2014	5.4	(2.8)	0.8	(0.3)	0.2	(0.0)	...	0.0	**3.3**
2015	(13.2)	0.2	(4.3)	(0.2)	(0.2)	(0.1)	...	0.1	**(18.2)**
2004 Q1	(2.1)	6.1	n.a	...	(0.1)	(0.0)	n.a	0.0	**4.0**
Q2	(17.3)	(4.5)	n.a	...	(0.1)	(0.0)	n.a	(0.0)	**(21.8)**
Q3	10.0	(5.9)	n.a	...	0.2	(0.0)	n.a	0.0	**4.2**
Q4	15.3	1.5	n.a	...	0.3	0.0	n.a	0.0	**17.2**
2005 Q1	20.0	0.8	n.a.	...	0.4	0.0	n.a.	0.0	**25.8**
Q2	27.6	4.8	n.a.	...	0.1	(0.1)	n.a.	0.0	**37.5**
Q3	(14.6)	5.5	n.a.	...	0.0	(0.0)	n.a.	0.0	**(6.9)**
Q4	(9.4)	(1.1)	n.a.	...	(0.1)	(0.0)	n.a.	0.0	**(8.7)**
2006 Q1	14.4	(1.9)	n.a.	(0.9)	(0.4)	(0.1)	n.a.	0.0	**11.1**
Q2	(2.7)	(0.1)	n.a.	(0.9)	0.0	0.0	n.a.	0.0	**(3.7)**
Q3	8.2	0.0	n.a.	0.5	0.1	0.1	n.a.	(0.0)	**8.8**
Q4	8.0	0.0	n.a.	0.5	(0.2)	(0.0)	n.a.	(0.0)	**8.2**
2007 Q1	(1.2)	0.5	n.a.	(0.6)	0.2	(0.1)	n.a.	(0.0)	**(1.2)**
Q2	3.2	(0.2)	n.a.	(0.1)	0.1	0.1	n.a.	(0.0)	**3.0**
Q3	2.2	(5.4)	n.a.	(0.3)	0.1	0.0	n.a.	(0.0)	**(3.5)**
Q4	(10.3)	1.5	n.a.	(0.2)	0.2	0.1	n.a.	(0.0)	**(8.8)**

Table 6 continued: Contribution (% Points) of each Mineral Group and Mineral to the Year-on-Year Percentage Change in the Volume of Mining Production (Base 2013 = 100)

	Diamonds	Copper-Nickel Cobalt Matte	Copper in Concentrates	Gold	Soda Ash	Salt	Silver	Coal	Total Index
Year/Weights	**82.5**	**8.6**	**5.5**	**1.4**	**0.9**	**0.5**	**0.4**	**0.3**	**100.0**
2008 Q1	(0.7)	0.4	n.a	0.5	0.1	0.1	n.a	0.0	**0.3**
Q2	(1.8)	(1.1)	n.a	0.1	(0.1)	(0.1)	n.a	0.0	**(3.1)**
Q3	0.1	4.9	n.a	0.4	(0.2)	(0.1)	n.a	0.0	**5.1**
Q4	(8.7)	(2.7)	n.a	0.9	0.0	(0.1)	n.a	0.0	**(10.6)**
2009 Q1	(88.2)	(2.4)	n.a.	(0.8)	(0.2)	0.0	n.a.	(0.0)	**(91.6)**
Q2	(45.6)	1.3	n.a.	(1.1)	(0.2)	0.0	n.a.	(0.0)	**(45.6)**
Q3	(32.0)	0.7	n.a.	(1.3)	(0.0)	(0.0)	n.a.	(0.0)	**(32.6)**
Q4	8.1	1.2	n.a.	(2.4)	(0.2)	0.1	n.a.	(0.0)	**6.9**
2010 Q1	594.7	27.2	...	(0.7)	1.4	0.7	n.a.	0.1	**626.4**
Q2	35.7	(6.0)	...	(0.4)	0.3	0.2	n.a.	0.0	**30.6**
Q3	1.9	(0.2)	...	0.4	(0.1)	0.3	n.a.	0.1	**3.2**
Q4	(24.7)	(1.6)	...	0.5	0.1	0.0	n.a.	0.0	**(24.8)**
2011 Q1	14.3	(3.4)	0.7	(0.4)	(0.1)	0.1	n.a.	(0.0)	**11.1**
Q2	4.0	0.4	0.8	(0.4)	0.1	0.1	n.a.	0.0	**5.0**
Q3	13.2	(10.7)	0.5	(0.4)	0.2	0.1	n.a.	(0.0)	**2.9**
Q4	(16.7)	(0.0)	0.3	0.0	0.0	0.1	n.a.	(0.1)	**(16.4)**
2012 Q1	(0.7)	1.4	0.5	0.4	0.1	(0.0)	n.a.	0.0	**1.6**
Q2	(8.6)	1.2	(0.1)	0.1	(0.0)	0.0	n.a.	(0.0)	**(7.3)**
Q3	(34.7)	1.5	0.8	(0.3)	(0.0)	(0.2)	n.a.	0.1	**(32.9)**
Q4	15.9	(1.3)	0.9	(1.2)	(0.2)	(0.1)	n.a.	0.4	**14.4**
2013 Q1	(11.0)	(2.1)	4.3	(0.9)	0.2	0.2	...	0.1	**(8.7)**
Q2	17.9	1.2	5.7	(0.3)	(0.1)	0.2	...	0.0	**25.2**
Q3	23.5	10.0	4.1	(0.1)	(0.2)	0.4	...	(0.0)	**38.4**
Q4	14.6	0.5	3.6	0.5	(0.3)	(0.1)	...	(0.1)	**19.1**
2014 Q1	21.0	(4.3)	0.2	0.3	(0.2)	(0.2)	(0.2)	(0.0)	**16.7**
Q2	(1.3)	(3.0)	(0.0)	(0.3)	0.2	(0.1)	(0.1)	0.1	**(4.5)**
Q3	11.4	(5.0)	2.4	(0.3)	0.0	(0.0)	0.1	0.0	**8.9**
Q4	(4.8)	0.4	0.6	(0.8)	0.4	0.2	0.1	0.0	**(4.0)**
2015 Q1	(2.0)	3.6	(1.3)	(0.6)	(0.3)	(0.0)	(0.1)	0.1	**(0.7)**
Q2	(4.6)	2.6	(4.3)	(0.3)	(0.2)	(0.2)	(0.4)	0.0	**(7.4)**
Q3	(28.5)	(2.6)	(6.3)	(0.1)	0.1	(0.0)	(0.6)	0.1	**(37.9)**
Q4	(17.0)	(2.5)	(5.7)	0.1	0.0	(0.1)	(0.4)	0.1	**(25.5)**
2016 Q1	(4.7)	2.8	(4.3)	0.1	0.4	0.0	(0.2)	(0.0)	**(5.9)**
Q2	(10.5)	(1.0)	(1.7)	0.4	(0.1)	(0.0)	0.0	(0.1)	**(13.0)**

Note: 1. () denote negative numbers
2. ...data is not zero but the figure is not significant enough to be measured

3.0 Technical Notes

3.1 Background

Mining activity in Botswana started in the 19th century with the production of Gold by Europeans from the Tati Reefs which is now the modern Francistown area. However, much of this activity could not be accounted for, despite its significant contribution to the economy at that time. Modern mining in Botswana started with the mining of Diamonds at Orapa in 1971 followed by Copper-Nickel production in 1973 at Selebi- Phikwe. Since the early 1980s, the mining industry has been the largest contributor to real gross domestic product (GDP), contributing between 30 and 50 percent.

These mineral contributions enabled the Government to undertake investments in both human and physical infrastructure development over time Even though the mining sector's contribution to GDP has been below 25 percent since the 2009 recession, available data indicates that the sector still leads in terms of value added contribution to GDP. Despite its great contribution to Botswana's GDP, the mining industry is capital intensive and accounts for less than 5 percent of employment in the private sector.

With such a significant contribution to the GDP, and the national economy, the need for a measure of change in the production of minerals in Botswana cannot be over emphasized. The index of physical volume of mining production is such a measure that provides a relative change over time in mining production. IMP can also be used as a deflator to calculate the gross domestic product (GDP) at constant prices.

3.2 Data collection

A mining production survey is carried out by the Department of Mines at the Ministry of Minerals, Energy and Water Resources, covering all mining establishments operating in the country. After the completion of data collection, the Department of Mines provides the data to Statistics Botswana. Following international standards and guidelines, Statistics Botswana cleans the data, produces statistical tables and produces reports which are then packaged and disseminated to users. The results of the survey are used to calculate the volume of mining production indices on a quarterly basis and subsequently to estimate GDP, also on a quarterly basis.

3.3 Scope of the survey

The survey covers all mining establishments conducting activities relating to the extraction of minerals occurring naturally as solids such as Diamonds, Copper-Nickel-Cobalt Matte, Copper in Concentrates, Gold, Soda Ash, Salt, Coal, Semi-precious stones and the quarrying of building materials. The activities are classified according to the International Standard of Industrial Classification of all Economic Activities, ISIC Rev 4, and Central Product Classification (CPC) Version 2.

4.0 Concepts, definitions and methods

4.1 Index of the volume of mining productions

The index of the volume of mining production is a ratio that indicates the increase or decrease of a magnitude. The index form is used not only for intertemporal comparisons but for comparisons between countries.

The IMP is an important macro-economic indicator which monitors progress and fluctuation of the mineral sector production in the economy. The Index is also known to be an effective tool that measures current production which indicates relative changes over time in the physical volume of mining production.

4.2 Base Period

The base period, usually a year, is the period against which other periods are compared and whose values provide the weights for an index. The base period, also referred to as reference period used in this brief is 2013 and it is set at 100.

4.3 Index weighting

The weight of the mineral group is the ratio of the estimated value of production of a mineral group to the total estimated value of production of the mining industry. The weight of a mineral group reflects the importance of the mineral group in the total mining industry. The relative importance of various mineral groups is different and these differentials need to be reflected while measuring the performance of the entire mining sector.

4.4 Seasonal Adjustment

Seasonal adjustment is a means of removing the estimated effects of normal seasonal fluctuations and typical calendar effects from the series so that the effects of other influences on the series can be more clearly recognised. Seasonal adjustment does not aim to remove irregular or non-seasonal influences which may be present in any particular month.

The data produced is not seasonally adjusted. However there is a further scope of producing and disseminating an additional seasonally adjusted series only when there is a clear statistical evidence and economic interpretation of the seasonal/calendar effects.

4.5 Year-on-year percentage change

Year-on-Year percentage change in a variable for any given period is the rate of change expressed over the same period.

4.6 Index Contribution (percentage points)

The contribution (percentage points) of a mineral group or mineral to the percentage change in the total mining production for a given period is calculated by multiplying the difference in the index for each mineral group or mineral by the weight of the mineral group or mineral and then diving by the previous period's total index. It indicates the extent to which each mineral group affects the overall growth of mining production.

4.7 Calculation of the Index of Mining Production

To calculate the evolution of physical volume of mining production on a quarterly basis, a Laspeyres indicator, base year 2013=100, was used. The index is calculated as the weighted arithmetic mean of the production relatives in respect of selected items. The weighted average is done to measure the importance of various mineral groups in the mining sector when calculating the comprehensive growth rate of the sector.

$$I = \frac{\sum R_i \times W_i}{\sum W_i}$$

Where; I is the index, R_i is the production relative of item i and W_i is the weight allocated to item i

The production relative (R_i) of the i^{th} item for the quarter has been calculated by using the formula:

$$R_i = \frac{P_{ic}}{P_{io}} * 100$$

Where P_{ic} is the production of the i^{th} item in the current quarter and P_{i0} is the production of the i^{th} item in the base year.