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ILMENITE UPGRADE TEST WORK FOR KOKO MASSAVA DEPOSIT DEMONSTRATES QUALITY TIO2 PRODUCT

Key Highlights:

- **Metallurgical testwork undertaken on an initial 100kg bulk sample from Koko Massava delivered a sizeable upgrade in Ilmenite product.**
- **Ultra Low Temperature Roasting (ULTR) under reduced conditions produced a quality upgraded Ilmenite product with 47.1% TiO_2, 0.9% SiO_2, 0.5% Al_2O_3, 0.1% Cr_2O_3 and <20ppm U+Th.**
- **The resultant upgraded TiO_2 Ilmenite product has potential to be used as a direct feedstock for sulphate pigment manufacture or as a feedstock for titanium slag manufacture.**
- **Further upgrade potential to an Ilmenite product approaching 50% TiO_2 exists with next step optimization.**
- **This metallurgical result supports the maiden JORC Resource of 1.423 billion tonnes at 5.2% total heavy mineral (THM) (refer ASX Announcement 22 April 2020) and establishes Koko Massava as a globally significant HMS asset.**

Chairman Mr Andrew Van Der Zwan stated: *"We have been successful in producing a 47.1% TiO2 concentrate product from a small, initial 100Kg sample and we are confident that further optimization will deliver near 50% from Koko Massava material. We have demonstrated commercial potential for this Ilmenite product, which can be used as a direct feedstock for sulphate pigment manufacture or as a feedstock for titanium slag manufacture. Along with the Zircon non magnetic and Titanomagnetite streams we are in good shape with Koko Massava as our foundation asset.*

We now turn our attention to the remainder of our exciting exploration portfolio, aimed at not just identifiying high grades but also greater valuable mineral assemblage. We have now discovered sands of much higher Ilmenite content relative to Titanomagnetite in other targets across our portfolio and we are confident our search for enhanced in-ground value will be successful. We are excited about our upcoming drill programs at Nhacutse, Poiombo and Bungane Prospects, as announced 17 August 2020, as well as promising future targets behind them, like Zulene.

We are also confident in the depth of products that our Mozambican portfolio could potentially deliver and in our ability to play an important role in addressing the ilmenite shortage predicted by many analysts over the coming years."

Introduction

MRG Metals Limited ("the **Company**" of "**MRQ**") (ASX code: MRQ) is pleased to announce the completion of metallurgical testwork undertaken on a 100kg bulk sample of mineralised material from the Koko Massava Mineral Resource in Mozambique. This follows the preliminary update on the metallurgical test work, which demonstrated that multiple products can be produced from Koko Massava material (ASX Announcement 13 July 2020).

This latest phase of initial metallurgical testwork has been completed to a Scoping Study level and is designed to complement the delivery of the globally significant Koko Massava maiden Mineral Resource Estimate (**MRE**) of **1.423 billion tonnes at 5.2% total heavy mineral (THM)** (ASX Announcement 22 April 2020). The testwork was undertaken by industry leading, independent consultants IHC Robbins at their laboratory in Brisbane.

The goal of the metallurgical test work program has been to characterise the process performance of the heavy mineral sand (**HMS**), including:

- conceptual process flow sheet development;
- the production of products; and
- the determination of mineral recoveries.

Metallurgical Test Work Details

A bulk sample of approximately 100kg of archived (Perth, Western Australia) aircore samples was sent to IHC Robbins in Brisbane. The sample is representative of the high grade mineralised zones of high valuable heavy mineral (**VHM**) from within the Koko Massava Mineral Resource.

As previously announced (ASX announcement 13 July 2020) the initial results for the metallurgical test work from Koko Massava indicated the resource material performed well to simple and standard heavy mineral sand processing techniques.

Processing of the material included:

- Feed Preparation Process (**FPP**) to remove the oversize and slime material;
- Wet Concentration Process (**WCP**) to produce a heavy mineral concentrate (**HMC**); and
- Concentrate Upgrade Process (**CUP**) to produce various mineral products.

The FPP demonstrated the material readily separated into slime (-45µm), oversize (+2mm) and sand (+45µm, -2mm) fractions, with tests of the slime material derived from the FPP confirming the slimes settled easily using a conventional flocculent with a high proportion of underflow solids. A standard coagulant was used to improve clarity of the overflow.

The WCP was undertaken over several stages of wet shaking tables to produce a HMC. This HMC outflow comprised 83.0% heavy mineral with 22.6% TiO2 and 0.77% ZrO2 (Table 1).

Overall recovery of rutile, leucoxene, altered ilmenite and ilmenite is calculated at 90.8%, 86.5%, 83.6% and 84.5%, respectively (Table 2).

Table 1: Results of XRF analyses of concentrate (Conc) material produced in the outflow of the WCP.

		Assay																		
WCP	Wt %	HM	TiO2	Fe2O3 (Total)	FeO	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	SO3	CaO	K2O	CeO2
		%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
Conc	5.0	83.0	22.6	52.1	16.2	2.7	2.6	1.7	0.5	0.6	0.77	0.06	12	148	0.4	0.0	0.0	0.1	0.0	0.0

Table 2: Results of calculated recovery of various mineral species based on Qemscan analyses of concentrate (Conc) material produced in the outflow of the WCP.

		Distribution											
WCP	Wt %	HM	Rutile	Leucoxene	Altered Ilmenite	Ilmenite	Low Ti Ilmenite	Ti Magnetite	Zircon	Kyanite/Sillimanite	Chromite	FeOxide	Others
		%	%	%	%	%	%	%	%	%	%	%	%
Conc	5.0	77.9	90.8	86.5	83.6	84.5	76.9	73.3	87.6	80.8	85.3	81.0	69.1

The CUP utilised the HMC outflow produced from the wet concentration process and involved processing it through a Low Intensity Magnetic Separator (LIMS), Wet High Intensity Magnetic Separators (WHIMS) and wet shaking tables to produce the raw ilmenite and non-magnetic concentrate products.

The ilmenite concentrate derived from the CUP is calculated to contain 37.1% TiO_2, 2.0% SiO_2, 2.1% Al_2O_3 and 2.9% Cr_2O_3 (Table 3). In addition, a non-magnetic concentrate enriched in zircon (Non-Magnetic Concentrate) was produced containing 77.9% heavy mineral, 13.6% TiO_2, 18.5% ZrO_2 and 2,088ppm U+Th (Table 3). It was determined a Standard grade zircon as well as rutile/HiTi products can potentially be produced from this non-magnetic concentrate. A titano-magnetite concentrate containing 14.8% TiO_2, 80.5% Fe_2O_3 (56.3% Fe), 1.7% SiO_2, 2.0% Al_2O_3 and 0.77% V_2O_5 was also developed.

Recovery of ilmenite into the ilmenite concentrate is calculated at 91.1% (Table 4). Recovery of rutile and zircon into the non-magnetic concentrate is calculated at 86.3% and 81.2% respectively, whilst recovery of titano-magnetite is calculated at 89% (Table 4).

Table 3: Results of XRF analyses of the various concentrates produced in the Concentrate Upgrade Process (CUP).

		Assay																		
CUP	Wt %	HM	TiO_2	Fe_2O_3 (Total)	FeO	SiO_2	Al_2O_3	Cr_2O_3	MgO	MnO	ZrO_2	P_2O_5	U XRF	Th XRF	V_2O_5	Nb_2O_5	SO_3	CaO	K_2O	CeO_2
		%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
Titano-Magnetite	31.2	100.0	14.8	80.5	14.1	1.7	2.0	0.4	0.2	0.4	0.0	0.0	0	28	0.77	0.0	0.0	0.1	0.0	0.0
Ilmenite Concentrate	44.3	96.6	37.1	52.3	25.4	2.0	2.1	2.9	0.8	1.0	0.2	0.1	3	161	0.19	0.1	0.0	0.1	0.0	0.1
Non-Mag Concentrate	3.9	77.9	13.6	14.5	1.2	15.7	8.5	3.0	0.7	0.2	18.5	0.7	249	1839	0.10	0.1	0.0	0.4	0.1	0.6

Table 4: Results of calculated recovery of various mineral species based on Qemscan analyses of the various concentrates produced in the concentrate upgrade process (CUP).

		Distribution											
CUP	Wt %	HM	Rutile	Leucoxene	Altered Ilmenite	Ilmenite	Low Ti Ilmenite	Ti Magnetite	Zircon	Kyanite/Sillimanite	Chromite	FeOxide	Others
		%	%	%	%	%	%	%	%	%	%	%	%
Titano-Magnetite	31.2	37.3	0.0	0.0	0.7	1.0	64.1	89.0	0.0	0.0	5.5	33.3	57.0
Ilmenite Concentrate	44.3	51.2	8.6	58.7	87.0	91.1	27.8	6.4	15.2	14.5	79.5	47.0	30.4
Non-Mag Concentrate	3.9	3.6	86.3	34.4	6.5	0.5	0.3	0.1	81.2	24.6	8.0	4.5	3.6

The raw ilmenite derived from the CUP was subjected to electrostatic and magnetic separation to produce an ilmenite product. This stage successfully produced an ilmenite product comprising 43.5% TiO_2, 54.3% Fe_2O_3, 1.1% SiO_2, 0.9% Al_2O_3 and <10ppm U+Th and 1.4% Cr_2O_3 (Table 5). Ilmenite recovery into the product is calculated to be 98.4% (Table 6).

Table 5: Results of XRF analyses of the various concentrates produced in the ilmenite upgrade process (IUP).

IUP	Wt %	Assay																	
		TiO2	Fe2O3 (Total)	FeO	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	SO3	CaO	K2O	CeO2
		%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
Ilmenite Product	82.8	43.5	54.3	30.9	1.1	0.9	1.4	0.6	1.1	0.1	0.0	0	0	0.2	0.1	0.0	0.0	0.0	0.0
Ilmenite Concentrate	100.0	37.8	52.3	25.9	4.6	2.2	2.8	0.8	1.0	0.3	0.1	9	138	0.2	0.1	0.0	0.1	0.1	0.1

Table 6: Results of calculated recovery of various mineral species based on Qemscan analyses for the upgraded ilmenite product.

IUP	Wt %	Distribution										
		Rutile	Leucoxene	Altered Ilmenite	Ilmenite	Low Ti Ilmenite	Ti Magnetite	Zircon	Kyanite/Sillimanite	Chromite	FeOxide	Others
		%	%	%	%	%	%	%	%	%	%	%
Ilmenite Product	82.8	3.0	33.6	58.7	98.4	87.2	93.2	0.0	0.0	35.4	32.4	52.0

A representative sample of the ilmenite product was roasted at ultra low temperature (ULTR; <650°C) under reduced conditions and then processed through a series of magnetic separators to produce an upgraded ilmenite product.

This standard low temperature roast test successfully produced upgraded ilmenite which is calculated to contain 47.1% TiO2, 0.9% SiO2, 0.1% Cr2O3 and <20ppm U+Th (Table 7). Tables 8 and 9 show the comparison of upgraded ilmenite product before and after roasting tests, highlightling the product of the successful low temperature roast.

Importantly, under the low temperature conditions used for the roast tests, the ilmenite structure is not changed and remains soluble within sulphuric acid, thereby enabling the resultant product to potentially be used as a direct feedstock for sulphate pigment manufacture or as a feedstock for titanium slag manufacture.

Table 7: Results of XRF analyses for the roasted (ULTR) ilmenite, showing the final ilmenite product (Ilmenite 1+2) comprising 47.1% TiO2.

ULTR	Wt %	Assay																	
		TiO2	Fe2O3 (calc)	FeO	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	SO3	CaO	K2O	CeO2
		%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
Ilmenite (1+2)	89.2	47.1	11.4	37.6	0.9	0.5	0.10	0.5	1.2	0.1	0.0	13	0	0.2	0.1	0.0	0.0	0.0	0.0

Table 8: Pre-roasted Ilmenite product.

Ilmenite		
TiO2	%	43.5
Fe2O3 (Total)	%	54.3
Fe2O3 (Calc)	%	20.9
FeO	%	30.9
SiO2	%	1.1
Al2O3	%	0.9
Cr2O3	%	1.4
MgO	%	0.6
MnO	%	1.1
ZrO2	%	0.1
P2O5	%	0.01
U	ppm	<10
Th	ppm	<10
V2O5	%	0.2
Nb2O5	%	0.06
SO3	%	0.00
CaO	%	0.02
K2O	%	0.02
CeO2	%	0.00

Table 9: Post-Roasted ilmenite product.

Roasted Ilmenite		
TiO2	%	47.1
Fe2O3 (Total)	%	0.0
Fe2O3 (Calc)	%	11.4
FeO	%	37.6
SiO2	%	0.9
Al2O3	%	0.5
Cr2O3	%	0.1
MgO	%	0.5
MnO	%	1.2
ZrO2	%	0.1
P2O5	%	0.01
U	ppm	13
Th	ppm	<10
V2O5	%	0.2
Nb2O5	%	0.06
SO3	%	0.00
CaO	%	0.02
K2O	%	0.02
CeO2	%	0.00

Authorised for release by the Board of MRG Metals Ltd.

For more Information please contact:

MRG Metals
Andrew Van Der Zwan
Chairman
M: +61 (0) 400 982 987
E: andrew@mrgmetals.com.au

Investor Relations
Victoria Humphries
NWR Communications
M: +61 (0) 431 151 676
E: victoria@nwrcommunications.com.au