Rustenburg and Johnson Matthey, An Enduring Relationship

SIXTY-FIVE YEARS OF CONTINUOUS COMMITTED DEVELOPMENT

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The background and history of the connection between the world's largest platinum producing group, the South African company Anglo American Platinum Corporation, and the United Kingdom company Johnson Matthey, is explained. The commitment of Amplats to meet the expected growth in demand for the six platinum group metals in the future and the role of Johnson Matthey in marketing these metals, and in contributing towards the development of advanced technological applications for them, will ensure that the needs of the industrial platinum users throughout the world will continue to be satisfied.

Prior to 1st January, 1995, Johannesburg Consolidated Investment Company Limited, "JCI", one of the leading mining finance houses in South Africa, controlled and managed three platinum group metals producing companies: Rustenburg Platinum Holdings Limited, Lebowa Platinum Mines Limited and Potgietersrust Platinums Limited. On 1st January, 1995, the Anglo American Corporation of South Africa, the controlling shareholder of JCI, restructured JCI forming three separate companies: a platinum mining operation, the Anglo American Platinum Corporation Limited, "Amplats"; a gold, coal and base metals mining operation, "JCI Ltd", and an industrial and property investment holding company, "Johnnic". Amplats is controlled by the Anglo American Corporation of South Africa.

Johnson Matthey's links to the South African platinum mining industry stretch back to the discovery of platinum-bearing deposits in the Bushveld Igneous Complex in 1924. The subsequent founding of Rustenburg Platinum Mines in 1931 to exploit the Merensky Reef marked the start of an enduring relationship between Rustenburg, the largest platinum producer in the world, and Johnson Matthey as agent, customer and refiner of the platinum group metals and base metals produced from the mining operations at Rustenburg.

The fledgling South African platinum industry suffered a severe blow in 1932 with the depression-induced collapse of the platinum price on international markets. As a result, mining operations at Rustenburg were suspended until the end of 1933 when they were recommenced on the advice of Johnson Matthey.

In 1938 Rustenburg's first major expansion programme, to 20,000 tons per month, was completed and the first smelter furnace and converter unit were commissioned. At this point the material delivered to Johnson Matthey changed from platinum group metal concentrates to the less bulky converter matte.

During the Second World War years, 1939 to 1945, mine production remained steady at around 25,000 tons per month, but as a result of improvements in Johnson Matthey's processing and refining technology, production of refined platinum increased to some 40,000 ounces per annum.

After the war an upsurge in platinum demand, initially from the chemical industry and later from other industrial sectors, resulted, over the next 30 years, in an ongoing series of expansions in production at Rustenburg. Platinum
output at Rustenburg doubled between 1947 and 1949, in part by the acquisition in 1949 of the operations of the Union Platinum Mining Co. Ltd. A decision to double the output again was taken in 1951 (at which time Rustenburg was producing ore at a rate of about 70,000 tons per month). At the same time agreement was reached with Johnson Matthey to form a jointly held company, Matte Smelters (Pty) Ltd, to erect and operate a plant in South Africa to produce saleable nickel and copper and a high grade platinum group metals refinery feed from a portion of the matte produced by Rustenburg. The balance of the Rustenburg matte continued to
be exported to Johnson Matthey in the United Kingdom for processing. The Matte Smelters plant was commissioned during 1954/1955.

The platinum requirements of the oil industry in the mid-1950s led to two further expansion programmes at Rustenburg, in 1955/56 and 1956/57. At this time it was also decided by the Board of Johnson Matthey, with the encouragement of the Directors of Rustenburg, to compile technical and scientific information on all the forms of platinum and the other platinum group metals. As part of this initiative the quarterly journal, *Platinum Metals Review*, was founded, and the first issue duly appeared in January 1957.

In 1958 the market experienced a sudden downturn attributable to a sharp reduction in offtake by the oil industry. Production at Union Section was temporarily suspended, and the output at Rustenburg was halved. However, increased industrial demand for platinum emerged again during the early 1960s and Rustenburg responded by undertaking another series of production expansions from about 1963 onwards, with platinum output eventually reaching 1 million ounces by 1970. These expansions included the exploitation, under tribute, which is a form of royalty agreement, of the mineral rights held by Brakspruit Platinum (Pty) Ltd, adjacent to the Rustenburg property. The assets and mineral rights of Brakspruit Platinum were eventually acquired by Rustenburg in 1972.

In 1969 a platinum group metals refinery, financed 80 per cent by Johnson Matthey and 20 per cent by Rustenburg, was commissioned at Wadeville in South Africa to treat a portion of Rustenburg's platinum group metal output from the Matte Smelters plant. The balance of the Rustenburg material continued to be refined by Johnson Matthey at Royston in the U.K. In 1972 Rustenburg and Johnson Matthey formed a jointly held company, Matthey Rustenburg Refiners (Pty) Ltd, "MRR", to acquire and operate the platinum group metals processing facilities owned and operated by Johnson Matthey and Rustenburg. Accordingly, MRR acquired the Wadeville platinum group metals refinery, Matte Smelters and Johnson Matthey's smelting and refining operations at Brimsdown and Royston in the U.K.

The platinum market slumped severely in 1971 causing Rustenburg to cut production by almost 50 per cent to some 550,000 ounces per annum. Fortunately, the successful development of autocatalyst technology by Johnson Matthey and Engelhard during the early 1970s represented the beginning of a major new application for platinum in 1975. In 1972, to meet this challenge, Rustenburg decided to expand production beyond the previous 1 million ounces per annum level, by developing its Amandelbult Section, some 120 km north of the Rustenburg mining operations. Rustenburg's production capacity was further increased in 1977, when the company acquired the mining operations of Atok Platinum Mines (Pty) Ltd, situated on the eastern limb of the Bushveld Complex.

Due to the expansion in Rustenburg's platinum output during the 1970s, Rustenburg and Johnson Matthey decided to replace the 23-year old Matte Smelters plant with a new MRR base metals refinery which would process Rustenburg's entire matte output into saleable nickel, copper, cobalt and a high grade platinum group metals refinery feed. The new base metals refinery became operational in 1981/82.

**Extraction Technology**

In 1980 Johnson Matthey concluded the successful testing of a pilot platinum group metals extraction plant based on Johnson Matthey's proprietary new solvent extraction, "Solvex", technology. The success of the pilot plant prompted Johnson Matthey and Rustenburg to build a pre-production scale Solvex plant at Royston. Construction began in 1981 and the plant was commissioned in 1983.

In 1984 it was agreed by Johnson Matthey and Rustenburg that Rustenburg should take over sole responsibility for the crucial stages of processing and refining. Accordingly, Rustenburg purchased the Wadeville platinum group metals refinery and the new base metals refinery from MRR. Rustenburg contracted MRR to manage the Wadeville refinery and MRR
continued to own and operate the platinum group metals refinery in Royston. Rustenburg decided in 1986 to erect a new platinum metals refinery in South Africa at Rustenburg Section using Johnson Matthey's Solvex technology. In 1987 Rustenburg acquired a controlling share in MRR and contracted MRR to manage the new refinery upon completion.

In 1988 Johnson Matthey purchased the Royston platinum group metals refinery from MRR. The new platinum group metals refinery, apart from employing the state-of-the-art Solvex refining technology, also provided Rustenburg with the necessary increased capacity to refine the additional platinum group metals sourced from two additional expansion projects begun in the late 1980s. These were the Amandelbult expansion project and the development of Potgietersrust Platinums Limited, the only open-cast platinum mining venture in South Africa. The new platinum group metals refinery was commissioned in May 1989 and the refining of Rustenburg’s platinum group metals at Wadeville and Royston ceased during the latter half of that year.

Over the 65 years that Rustenburg and Johnson
Matthey have been associated, the business relationship between the two companies has been governed by numerous Marketing and Refining Agreements. An important milestone in the relationship was reached in 1992, when the 1972 Marketing Agreement was renegotiated and supplemented by a new Principal Sales Agreement. The term of these two agreements ensures the continuation of the Rustenburg/Johnson Matthey relationship (including the two other producers in the Amplats stable) well into the future.

In addition to the purchase of services provided by Johnson Matthey under the Marketing Agreement (Market Research for example) Rustenburg also jointly funds certain research and development programmes for technical applications with Johnson Matthey. These activities are performed at the various Johnson Matthey Technology Centres.

Development of New Applications
The development of new technical applications for platinum and the expansion of the existing platinum jewellery markets are vital for the long-term prosperity of the platinum producing and fabrication industries. Rustenburg has recognised the importance of funding market support and development programmes since the early 1970s.

In 1975 Rustenburg supported the founding of the Platinum Guild International, “PGI”, specifically to promote platinum jewellery in Japan. The tremendous success of this operation is shown by an estimated demand for platinum jewellery in Japan of 1.49 million ounces in 1995, the twelfth year of continuous growth in the Japanese platinum jewellery market. PGI subsequently established offices to develop markets for platinum jewellery in Germany (1976), Italy (1986) and the United States of America (1992). In 1986 PGI opened an office in the U.S.A. to promote platinum investment products.

In the 21 years since PGI was founded the Amplats group of producers have invested a cumulative R 562.5 million in platinum jewellery and investment market development. Amplats and Johnson Matthey co-operate closely in platinum jewellery market development, with Johnson Matthey concentrating on the manufacturing and technical side of the jewellery industry and Amplats – through its involvement with the PGI – providing support for the promotion of platinum jewellery to manufacturers, retailers and consumers. This joint approach has had considerable success, particularly in the United States, where platinum jewellery demand has more than trebled since 1991. The huge potential of the Chinese market has not gone unrecognised by Johnson Matthey and Amplats. Several market research studies have been commissioned and Johnson Matthey has taken the first steps to establish a viable presence for the sale of platinum jewellery in China.

Platinum Supplies Will Meet Expected Demand
Given the likelihood that the platinum market will continue to expand in the future – largely in response to Amplats’ market development initiatives via the PGI and those undertaken in collaboration with Johnson Matthey – Amplats has already taken steps, in the form of the expansions undertaken in 1989, to ensure that platinum supplies from the group’s mining and processing operations will be able to meet the expected growth in demand. Furthermore, a smelter refurbishment and expansion programme, started in 1990, has recently been completed at Rustenburg and various new mine expansion options are currently being assessed. These include low-cost expansions at the Potgietersrust open-cast operation (currently the lowest cost producer in the industry), expansion of UG2 production at the Amandelbult Section and possible new mines at Boschkoppie and Kruidfontein, located between Rustenburg and Union Sections. In addition, a programme is already in place to increase output gradually at Lebowa Platinum Mines.

The proposed expansion of productive capacity at all the Amplats’ group mining operations will be done in such a manner as to enable Amplats not only to take full advantage of favourable market conditions but also, if market conditions prove temporarily adverse, to
Making palladium grain at the precious metals refinery

enhance the group's competitiveness by reducing production from relatively high-cost areas. The mutually beneficial relationship between Rustenburg and Johnson Matthey has successfully weathered the numerous changes in the make-up, structure and fortunes of the platinum market over the past 65 years. As the 21st Century approaches there is every reason to believe that this fruitful association will continue to flourish.