



ICM

JUNE 2018

OPERATIONS MANAGEMENT – PRE-ISSUED CASE STUDY & GUIDELINES

Important notes for candidates regarding the pre-issued case study

The case study is designed to assess knowledge and understanding of the Operations Management syllabus in the context of the relevant case study. The examiners will be marking candidates' scripts on the basis of the questions set. Candidates are advised to pay particular attention to the mark allocation on the examination paper and to plan their time accordingly.

In order to prepare for the examination, candidates will need to carry out a detailed analysis of the case material ahead of the examination. Candidates have sufficient time during the examination to answer all the questions, but this means that detailed analysis has taken place before commencing the examination. The examiners are looking for clear evidence that candidates have a good understanding of the case and can apply and interpret the concepts and ideas learned from a study of the syllabus when answering the questions. Candidates are advised not to waste valuable time collecting unnecessary data but are permitted to conduct additional research into the case study organisation from relevant sources outside of the content of the attached pre-issued case study. Such additional research should attempt to identify significant characteristics and approaches to Operations Management taking place within the case study organisation, together with any particular issues, problems or challenges faced by the organisation. This may help inform any analysis carried out within the examination session. Any notes, including references drawn from this additional research, must be contained within the notes permitted in the examination room (see below).

The copying of pre-prepared 'group' answers, including those written by other third parties, is strictly forbidden and will be penalised. Thus, questions will demand analysis in the examination itself and individually composed answers are required in order to pass.

Candidates are only allowed to take up to two pages (four sides) of A4 notes into the examination room. These notes should be securely attached to the answer script at the end of the examination and returned. Your prepared notes will count for 15% of the overall mark for this unit and therefore it is important that you ensure that these notes are included with your answer script.

The notes will be assessed as follows:

- Relevant and broad research into conceptual framework through recommended academic sources [5 marks]
- Broad and appropriate summarisation and abbreviation of main features of case study [5 marks]
- Clearly structured and effectively organised notes, providing evidence of sound analytical approach and clear focus on relevance and significance [5 marks]

A copy of this case study will be available in the examination. Therefore, you will NOT be allowed to bring this case study into the examination room.



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OPERATIONS MANAGEMENT
CASE STUDY – FIRST QUANTUM MINERALS LTD (Basic Resources/Mining sector)

EXTRACT FROM THE ANNUAL REPORT 2016

Chief Executive's Introduction

First Quantum Minerals was founded in 1996 on the unwavering belief in the long-term fundamentals of copper. From the beginning, we have sought good-quality assets to which we can apply our unique technical expertise and in jurisdictions where we could operate safely and cost effectively. This strategy has led to successes in both exploration and acquisition which have benefitted the Company and its stakeholders. Today, First Quantum is a leading copper producer with unrivalled growth in copper production capacity. First Quantum Minerals Ltd is a well-established and growing metals and mining company producing mainly copper, gold, nickel and zinc. The Company's assets are located in Zambia, Spain, Mauritania, Australia, Finland, Turkey, Panama, Argentina and Peru. In 2016, First Quantum produced 539,458 tonnes of copper, 214,012 ounces of gold, 23,624 tonnes of nickel and 28,862 tonnes of zinc from continuing operations.

Key Achievements

- Progressed our Cobre Panama Project to over 46% of completion while remaining within budget and on track for a phased commissioning in 2018 and ramp-up in 2019.
- Increased copper production by over 30% compared to 2015 with the ramp-up of the Sentinel mine, and continued strong performances across the operations.
- Further Improved our copper production unit cost mainly through the efficiencies of operating our Kansanshi copper smelter and sustainable savings achieved from our company-wide cost savings program.

Letter to Shareholders

The challenging conditions for the natural resource industry experienced in 2015 intensified in the early part of 2016. Prices for metals were low and volatile for much of the year which put the financial position of many producers under pressure. For First Quantum's main metal, copper, the LME cash price for the year ranged from a low of US\$1.96 per pound to a high of US\$2.69 per pound, well below that of 2015. However, sentiment and conditions improved considerably in the latter part of the year.

Strong Results in 2016. I am pleased to report that First Quantum ended 2016 in a stronger position than at the start of the year. Much of the improvement was due to the commitment by our entire workforce to remain focused on delivering on our well-defined action plan. As a result, all aspects of the Company performed well. Copper production for the year was the highest in the history of First Quantum. The transition to commercial operations at the Sentinel mine was a major milestone as were the performances of the Kansanshi mine and smelter and the Las Cruces mine. The synergies realised by the Kansanshi smelter during 2016, and the benefits to revenues and costs for the first full operating year, clearly justify the decision to invest in it.

The Company's financial position was improved by a number of measures including; the sale of the non-core Kevitsa operation, the refinancing of the corporate loan and credit facilities and our company-wide cost savings program. Our goal of protecting cash flows, particularly while the Cobre Panama project is under construction, is underwritten by our copper sales hedge program. For 2016, this program achieved its purpose and generated an additional US\$60 million of revenues. In light of the volatility we have seen in commodity prices over the past 18 months, we are continuing the program because we believe this is prudent, at least until any risk to the project's completion has been mitigated. Amid some of the most challenging and volatile market conditions, our employees remained focused. Together our efforts produced the highest copper production and sales in the Company's history, reduced the unit production cost and importantly, improved the financial flexibility to support our operating and growth plans.

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Zambian Developments

The supply of electricity to our operations in Zambia improved markedly over the course of 2016. As expected, an additional 420 megawatts of in-country generating capacity was introduced into the system and the second power line connecting the Sentinel mine to the national grid was energized. Following this, we declared the mine in commercial operations in November. Major improvements to the country's mining tax regime were legislated during the year which brought it more in line with other mining jurisdictions in the world. We view this as a positive step especially considering the importance of the mining industry to the Zambian economy.

The industry is a substantial employer, both directly and indirectly, and it is estimated to account for about 12 percent of the country's gross domestic product. First Quantum was founded in 1996 on the unwavering belief in the long-term fundamentals of copper. At that time, the metal traded below US\$1.00 per pound. While it currently trades at much higher levels, in our opinion, it still does not fully reflect the realities of the industry. Depletion of reserves at existing mines, the scarcity of new and undeveloped deposits and the high cost and extended timeframe to develop new mines are some of the supply constraints facing the industry today. Juxtapose this with global demand that continues to grow, and the fundamentals are obvious.

We believe First Quantum, with our exploration expertise, project development philosophy and track record, tier-one producing assets and attractive project pipeline, is in a particularly strong position; possibly uniquely so.

Addition of Tier-One Assets

With the transition of the Sentinel mine to commercial operations, we now have an operating platform of seven mines and one copper smelter across six countries. Sentinel is a long-life mine that can add up to 250,000 tonnes of copper annually to our production. The next expected addition is the Cobre Panama project which is now about 50 percent complete. This project is an excellent example of what is entailed in building new mines of this capacity. In addition to developing the mine and normal associated on-site infrastructure, we have had to build a port and power plant. The project's first 20-year term mining license has already expired even though the mine is not yet in operation. The second 20-year term mining license is now in effect through to March 2037 with an automatic right to renewal for a third term at that time.

Sustainability

- Pursuing future goals while managing present realities
- Driving growth while fostering conservation
- Providing support while encouraging self-sufficiency
- Operating responsibly while delivering value to shareholders

This is the perpetual balancing of expectations that defines our path to sustainability. To learn more about our work to promote sustainable development and deliver lasting benefits for a broad range of stakeholders, visit www.first-quantum.com/Corporate-Responsibility.

On Site Operations

Construction activities ramped up during 2016, with the port and power station area currently at peak construction levels. We expect to have commercial power available in the fourth quarter of this year from the first of two 150 megawatt generating sets. The second set is planned to follow six months later and will bring our total generating capacity to 300 megawatts. This is sufficient for our needs and will allow the sale of excess capacity into the Panama grid. The mine site and process plant area are growing towards planned peak construction in the third and fourth quarters of 2017. Commissioning is targeted to begin in 2018 and continue towards steady-state operation and ramp-up in 2019. Cobre Panama has an estimated mine life of over 30 years. When in commercial operation, it is expected to add over 300,000 tonnes of copper to our annual production.

Sentinel, Cobre Panama and our earlier-stage projects, Haquira and Taca Taca, are all tier-one copper assets that were valuable additions to the Company's portfolio. Their acquisition was founded on a belief that we can create value by applying our project development expertise. This philosophy has served us well throughout our history. Our future goal is to continue creating value for our shareholders by pursuing similar opportunities.

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BUSINESS OVERVIEW

Challenging conditions continued in 2016 for the natural resource industry. Market prices for metals remained low for most of the year which put the financial position of many producers under pressure. For the Company's main metal, copper, the LME cash price for the year ranged from a low of US\$1.96 per lb to a high of US\$2.69 per lb. The year's average of US\$2.20 per lb compared to US\$2.49 per lb for the previous year.

In 2015, First Quantum introduced a number of measures to further strengthen its financial position in light of the market conditions. The execution of these measures was successfully carried into 2016 with the sale of the non-core Kevitsa operation, completion of a refinancing, continuation of the sales hedge programs and maintenance of the company-wide margin improvement programs. At year-end 2016, First Quantum had US\$713 million of committed undrawn facilities, US\$565 million in net unrestricted cash, US\$964 million of working capital, as well as future cash flows which support its operating and growth plans. The Company was in full compliance with all its debt covenants. At February 16, 2017 the Company had 432,500 tonnes of unsettled unmargined copper sales hedges at an average US\$2.27 per lb with maturities to December 2017. Operations were strong in 2016. New Company records for annual copper production and sales were set as the Sentinel operation ramped up over the course of the year and the Las Cruces mine achieved its highest operating levels. As a result, the Company's gross profit exceeded that of 2015 despite the much lower copper price. In 2016, 60% of the Company's revenues were generated from our operations in Zambia. In June 2016, a new mining tax regime came into effect which reduced the mining royalty rates for open pit mining from 9% to a sliding scale of 4% to 6% depending on the London Metals Exchange (LME) monthly average price, retained the 30% corporate tax, eliminated the variable profits tax and suspended the 10% export duty on ores and concentrates applicable to nickel for which there are no processing facilities in the country.

In July 2015, power generation and supply in Zambia was impacted by low water levels in the Kariba dam which provided the majority of the country's electricity. This directly impacted the ramp-up of First Quantum's Sentinel operation. Over the course of 2016, power supply was augmented by imports from other southern African countries and a critical power line connecting Sentinel to the national grid was completed and energized. With stable and increasingly higher power supply, Sentinel was declared in commercial production effective November 1, 2016. Development of the Cobre Panama project continues on track for a phased commissioning in 2018 and continued ramp-up in 2019. The project is owned 80% by First Quantum and 20% by Korea Panama Mining Corporation. Its development capital is being funded on the same percentage basis with First Quantum's share inclusive of a US\$1 billion contribution from Franco-Nevada under a precious metals stream agreement. When Cobre Panama is completed and fully operational, it is expected to add over 300,000 tonnes of copper to First Quantum's total annual production.

Complete Annual Report 2016 for First Quantum Minerals Ltd available at: www.annualreports.co.uk