# A Technical Report on the Material Assets of Katanga Mining Limited Katanga Province, DRC

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## Explanatory Note

This document has been written in accordance with the requirements of the International System ("SI") of Units ("SI Units") as applied in South Africa. The SI is the only system of units that is universally recognised. As a result, it has a distinct advantage in establishing a dialogue globally. Even so, some readers will be unfamiliar with the conventions of SI Units. For example, in this document, the comma is used as the decimal marker and the space is used for the thousands separator (for numbers larger than 999).

In other words, 10 148,32 denotes ten thousand one hundred and forty eight point three two. The word 'ton' denotes a metric ton (1000 kg), unless otherwise stated. More information is available from the website of the Bureau International des Poids et Mesures at www.bipm.org. The website offers a comprehensive, 88 page guide of SI Units in pdf format.

In some instances, non-SI Units are included. For instance, base metal prices are commonly quoted in US Dollars per pound ("USD/lb"). In most instances, the inclusion of the metric equivalent is deemed unnecessary.

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# 3. SUMMARY

## 3.1. Introduction

This Technical Report was prepared by Katanga Mining Limited ("KML") in order to support the disclosure in a KML press release dated 8 September 2009 of KML's intention to accelerate ramp up of production to 150 ktpa of copper and 8 ktpa of cobalt (the "Accelerated Development Plan").

The information contained in this Technical Report is current as of 31 December 2009, unless otherwise noted.

## 3.2. Property Description and Location

This Technical Report covers the following operations, projects and associated infrastructure of KML and its subsidiaries located in the Kolwezi District of the Katanga Province in the Democratic Republic of Congo ("DRC") which are collectively referred to herein as the "Material Assets":

- Mining assets:
  - Kamoto, an operating underground mine ("Kamoto Underground Mine");
  - T17, an operating open pit mine ("T17 Open Pit");
  - KOV open pit mine, a development project ("KOV Open Pit");
  - Mashamba East mine, a development project ("Mashamba East Mine");
  - Tilwezembe, a recently closed open pit mine ("Tilwezembe Open Pit"); and
  - Kananga, a dormant open pit mine ("Kananga Mine").
- Processing assets:
  - Kamoto, an operating concentrator ("Kamoto Concentrator"); and
  - Luilu, an operating metallurgical plant ("Luilu Metallurgical Plant").
- Infrastructure necessary for the production of the saleable metals.

## 3.3. Ownership

KML owns a 75% equity interest in Kamoto Copper Company SARL ("KCC") and DRC Copper and Cobalt Project SARL ("DCP") which together own the Material Assets. The balance of the equity interests in KCC and DCP are owned by La Générale des Carrières et des Mines ("Gécamines"). Until completion of the KCC/DCP merger described in Section 6, the exploitation rights for the Kamoto Underground Mine, the Mashamba East Mine and the T17 Open Pit together with the Kamoto Concentrator and Luilu Metallurgical Plant will continue to be held in KCC and the exploitation rights for the KOV Open Pit, the Tilwezembe Open Pit and the Kananga Mine together with the WOL/SX/EW Refinery Project will continue to be held in DCP.

By decision of the shareholders of KCC and DCP dated 2 September 2009, these two entities have agreed to merge (DCP being absorbed by KCC) and the Presidential Decree required for final completion of the merger is expected to be issued very shortly.

Upon completion of the KCC/DCP merger, all assets (including the mining rights) and liabilities of DCP will be transferred to KCC. This is expected occur shortly since favourable opinions of the Cadastre Minier de la République Démocratique due Congo ("CAMI") regarding the transfer of the exploitation permits of DCP to KCC have already been issued.

KML and its affiliated companies will continue to have a 75% equity interest in the merged KCC, with the remaining 25% being held by Gécamines and La Société Immobilière du Congo ("SIMCO"), a company affiliated with Gécamines.

## 3.4. Geology and Mineralization

The primary body of text in this Section remains substantially unchanged from the equivalent Section in the 2009 Technical Report. For the purpose of this Technical Report, the Qualified Person responsible is Tim Henderson, a consultant to KML. Mr. Henderson is a Qualified Person within the meaning of N1 43-101.

### 3.4.1. Geology

The mineralized zones are at the western end of the Katangan Copperbelt, which contains some of the world's richest copper, cobalt and uranium deposits and is one of the great metallogenic provinces of the world. These deposits are hosted mainly by metasedimentary rocks of the late proterozoic Katangan system, a 7 km thick succession of sediments with minor volcanics, volcanoclastics and intrusives. Geochronological data indicate an age of deposition of the Katangan sediments of about 880 million years and deformation during the Katangan orogeny at less than 650 million years. This deformation resulted in the NE-SE trending Lufilian Arc, which extends from Namibia on the west coast of Africa through to Zambia, which lies to the south of the DRC. Within the DRC, the zone extends for more than 300 km from Kolwezi in the north-west to Lubumbashi in the south-east.

Stratigraphically, the rich copper and cobalt deposits found in Zambia and the DRC are localized in the Roan Supergroup ("Roan"). The Roan occurs at the base of the Katanga succession, unconformably overlying the basement rock of Kibaran age (mid-Proterozoic). The Roan is separated from the overlying rocks of the Upper and Lower Kundelungu supergroups by a conglomerate, the grand conglomerate. The Lower Kundelungu is composed of sandstones and shales with a basal conglomerate, while the Upper Kundelungu consists essentially of sediments and is separated from the Lower Kundelungu by a conglomerate, the (French) "Petit Conglomerate".

Within the Lufilian Arc are large-scale folds with wavelengths extending for kilometres. The folds are faulted along the crests of the anticlines through which rocks of the Roan have been diapirically injected into the fault zones, squeezed up fault planes and over-thrust to lie above rocks of the younger Kundelungu. The over-thrust Roan lithologies occur as segments or "fragments" on surface. The fragments are intact units that preserve the original geological succession within each. A fragment could be hundreds of metres and aligned across the fault plane.

In the Katangan Copperbelt, mining for copper and cobalt occurs in these outcropping to sub-outcropping fragments

### 3.4.2. Mineralization

Primary mineralization, in the form of sulphides, within the Lower Roan is associated with the D Strat and RSF for the OBI and the SDB and SDS for the OBS and is thought to be syn-sedimentary in origin. Typical primary copper sulphide minerals are bornite, chalcopyrite, chalcocite and occasional native copper while cobalt is in the form of carrolite. The mineralization occurs as disseminations or in association with hydrothermal carbonate alteration and silicification.

Supergene mineralization is generally associated with the levels of oxidation in the sub-surface sometimes deeper than 100 m below surface. The most common secondary supergene minerals for copper and cobalt are malachite and heterogenite. Malachite is the main mineral mined within the confines of the current KOV Open Pit.

The RSC, a lithological unit stratigraphically intermediate between the OBS and OBI host rocks, contains relatively less copper mineralization. The RSC contains appreciable copper mineralization near the contacts with the overlying SDB formation and the underlying RSF formations. The middle portion of the RSC, considered to be "sterile" by Gécamines, normally contains relatively less copper mineralization and is sometimes not sampled. The mineral potential of the RSC is less well known than that of other formations. The RSC has been observed to be well mineralized in supergene cobalt hydroxide and heterogenite, which occurs as vug infillings, especially near the surface.

The mineralization at Tilwezembe Open Pit is atypical being hosted by the Mwashya or R4 Formation. The mineralization generally occurs as infilling of fissures and open fractures associated with the brecciation. The typical mineralization consists mainly of copper minerals (chalcopyrite, malachite and pseudomalachite), cobalt minerals (heterogenite, carrolite and spherocobaltite) and manganese minerals (psilomelane and manganite).

## 3.5. Status of the Material Assets

Tables 3.5.1 and 3.5.2 below provide certain details on the status of KML's Material Assets.

**Table 3.5.1: Summary Table of Material Mining Assets**

| | | | | Licence | | |
|---|---|---|---|---|---|---|
| **Property** | **Holder** | **Type** | **Status** | **Expiry Date** | **Area** | **Comments** |
| Kamoto Underground Mine<br>Mashamba East Mine | KCC | ug<br>op | Operating<br>Development | 3 April 2024 | 11,04 km2 | Mine operational<br>Dewatering deferred to 2016 |
| T17 Open Pit | KCC | op | Operating | 3 April 2024 | 1,698 km2 | Mine operational |
| KOV Open Pit | DCP | op | Development | 3 April 2024 | 8,49 km2 | Pre-stripping, dewatering and production scheduled for 2010 |
| Tilwezembe Open Pit | DCP | op | Dormant | 3 April 2024 | 7,64 km2 | Operations ceased in November 2008 due to lower copper/cobalt prices |
| Kananga Mine | DCP | op | Dormant | 3 April 2024 | 11,04 km2 | Operations ceased due to pending relocation of rail line |
| Extension of Kananga | KCC | op | Dormant | 7 May 2022 | 0,849 km2 | Operations ceased due to pending relocation of rail line |
| **op = open pit** | | | | | | |
| **ug = underground** | | | | | | |

**Table 3.5.2: Summary Table of Material Processing Assets**

| Property | Holder | Status |
|---|---|---|
| Kamoto Concentrator | KCC | Operating |
| Luilu Metallurgical Plant | KCC | Operating |

## 3.6. Mineral Resources and Reserves

At 31 December 2009, KCC and DCP have Measured and Indicated Mineral Resources of 294,4 Mt of ore with a grade of 4,03% Cu and 0,46% Co which is described in Table 3.6.1 below.

**Table 3.6.1: KCC/DCP Mineral Resources as at 31 December 2009**

| Resource Classification | Mt | % T Cu | % T Co |
|---|---|---|---|
| Measured | 32,0 | 4,51 | 0,58 |
| Indicated | 262,4 | 3,97 | 0,45 |
| Measured and Indicated | 294,4 | 4,03 | 0,46 |
| Inferred | 179,5 | 2,34% | 0,31% |

(1) Mineral Resources have been reported in accordance with the classification criteria of the South African Code for the Reporting of Mineral Resources and Mineral Reserves (the "SAMREC Code").
(2) Mineral Resources are inclusive of Mineral Reserves.
(3) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

At 31 December 2009, KCC/DCP had Proved and Probable Mineral Reserves of 137,6 Mt of ore with a grade of 4,51% Cu and 0,43% Co which is described in Table 3.6.2 below.

**Table 3.6.2: KCC/DCP Mineral Reserves as at 31 December 2009**

| Reserve Classification | Mt | % T Cu | % T Co |
|---|---|---|---|
| Proved | 15,9 | 3,50 | 0,51 |
| Probable | 121,7 | 4,64 | 0,42 |
| Proved and Probable | 137,6 | 4,51 | 0,43 |

(1) Mineral Reserves have been reported in accordance with the classification criteria of the SAMREC Code.

## 3.7. Development

The primary development within the Mining Assets has been the optimization of the KOV Open Pit with a view to achieving the following:

- Initial production of ore to start in 2010 with an accelerated ramp up.
- Reduce the pre-strip requirement and the initial operational open pit strip ratio to provide a positive impact on the cash flow of the projects.
- Kamoto East orebody to be mined using Kamoto Mine underground infrastructure, commencing 2014.
- Mine planning to remain robust and flexible to meet ore requirements to achieve the Accelerated Development Plan to 150 ktpa copper while:
    - optimizing future production and recoverability of resources; and
    - allowing for a further expansion of mining activities to support future production increases to 310 ktpa copper.

The primary development in the process plant has been the combining of old Phases 3 and 4 into a single new Phase 3 which will take installed copper and cobalt production capacity up to 150

ktpa and 8 ktpa, respectively, through the refurbishment of existing facilities and infrastructure at the Kamoto Concentrator and the Luilu Metallurgical Plant by the end of the second quarter 2011. The old and new phasing are as set out below:

| Old Phase | Completion | Increase in Copper capacity '000 tonnes per annum | Increase in Cobalt capacity '000 tonnes per annum | New Phase | Completion | Increase in Copper capacity '000 tonnes per annum | Increase in Cobalt capacity '000 tonnes per annum |
|---|---|---|---|---|---|---|---|
| **Refurbishment of existing facilities** | | | | | | | |
| 1 | 2007 | 35 | 2 | 1 | 2007 | 35 | 2 |
| 2 | 2009 | 35 | 4 | 2 | 2009 | 35 | 2 |
| 3 | 2011 | 40 | 3 | 3 | 2011 | 80 | 4 |
| 4 | 2012 | 40 | 1 | | | | |
| Sub total | | 150 | 10 | | | 150 | 8 |
| **New WOL/SX/EW Refinery Plant** | | | | | | | |
| 5 | 2015 | 160 | 19 | 4 | 2013 | 80 | 12 |
| | | | | 5 | 2015 | 80 | 10 |
| Sub total | | 160 | 19 | | | 160 | 22 |
| | | | | | | | |
| **Total Capacity** | | **310** | **29** | | | **310** | **30** |

## 3.8. Interpretations and Conclusions

The results and interpretations of development of the Material Assets are reported elsewhere in this report and have been relied upon to compile the Mineral Resource statement included in Section 19.

## 3.9. Recommendations

Recommendations for future work include specific action programs on dewatering, geotechnical evaluation for open pits, tailings dam development and the review of the process engineering for new Phases 4 and 5 in a Scoping and Engineering Study to be conducted during 2010.

## 3.10. Economic Analysis

At 1 January 2010, the net present value ("NPV") of all phases of the project, including old/new Phases 1 and 2 and new Phases 3, 4 and 5, at a discount rate of 14% is USD 3 003 million which is an increase from the NPV of USD 99 million at 1 January 2009, as reported in the 2009 Technical Report. The increase is a result of a reduction in the processing capital expenditure for the new Phases 3, 4 and 5, an increase in copper and cobalt prices, the exclusion of the net cash outflows in 2009 (operations and capital) and a reduction in operating costs based on a further year of analysis of the actual costs.

# 4. INTRODUCTION

This Technical Report has been prepared for Katanga Mining Limited by KML's staff and a Qualified Person.

This Technical Report has been prepared to support material changes in the scientific and technical information concerning the Kamoto/Mashamba East Mine, the KOV Open Pit, the Kamoto Underground Mine, and two oxide open pit resources properties in the Kolwezi District of the DRC (collectively, the "KML Mines") since KML filed its last Technical Report on SEDAR on

31 March 2009. Specifically this Technical Report supports the Company's disclosures regarding the Accelerated Development Plan.

The Technical Report was prepared in compliance with the standards set out in the Canadian Securities Administrators' NI 43-101, Companion Policy 43-101CP and Form 43-101F1 and in conformity with SAMREC's generally accepted guidelines prepared by the South African Mineral Committee under the auspices of the South African Institute of Mining and Metallurgy. KML is a "producing issuer" under the definitions of NI 43-101 and a "reporting issuer" under Canadian securities legislation.

## 4.1. Qualified Person

This Technical Report was compiled by Mr. Tim Henderson, C.Eng.. Each aspect of this Technical Report was prepared by or under the supervision of Mr. Henderson who is an appropriately Qualified Person as defined by NI 43-101. Mr. Henderson retains responsibility for his contribution described above.

Mr. Tim Henderson, C.Eng. (registration number 438770) is a Qualified Person and has been a consultant to KML since April 2009, prior to which he was the Director General of KCC from September 2008 through April 2009.

## 4.2. Site Visits

In compliance with NI 43-101 guidelines, Mr. Henderson has completed a current inspection of the KML Mines.

Mr. Henderson visited the KML Mines on multiple occasions since December 2009 to supervise the geological and mining aspects of their operation and development, including as they relate to the process plant. His most recent site visits in preparation for this Technical Report were carried out during one week in January 2010, two weeks in February 2010 and one week in March 2010. During these visits, Mr. Henderson verified and validated the working protocols regarding the development of geological resources and reserves, mining plans and process plant development. Discussions were held with the participation of Mr. John Ross, Chief Executive Officer of KML, and Mr. Itamar Machado, General Manager, Mining of KCC. Mr. Henderson took underground and surface tours during these visits.

## 4.3. Basis of the Technical Report

This Technical Report was prepared as an update to the 2009 Technical Report to reflect the Accelerated Development Plan and the development of an optimized KOV mining plan.

Many items presented in this Technical Report have as a basis, information compiled in the 2009 Technical Report that was published on SEDAR on March 31, 2009. The information on geological, engineering, legal, operating, economic, social, environmental and other factors (including operating cost estimates) that is presented in this Technical Report was derived from the KML Mines Life of Mine plan revised in October 2009 and the 2009 Technical Report and updated from more recent information such as current experience at the KML Mines where underground and open pit mining and mineral processing are ongoing.

The capital cost to complete the Accelerated Development Plan that has been compiled along with estimates to complete the project presented herein are current as of February 2010.

The copper and cobalt prices used in this Technical Report were based on the market information available as of February 19, 2010, which for copper was the LME futures price and for cobalt was the 99.8% metal price for spot delivery reported in the Metal Bulletin.

The economic analysis presented in this Technical Report is current as of February 2010.

## 4.4. Terms of Reference

Unless otherwise stated, (a) all units of measurement in this Technical Report are metric (b) all costs are expressed in United States dollars and (c) the payable metals, copper (Cu) and cobalt (Co), are priced in United States dollars per pound.

The abbreviations used in this Technical Report are set out in the Glossary included at the end of this Technical Report.

# 5. RELIANCE ON OTHER EXPERTS

The Qualified Person for this Technical Report retains responsibility for it as outlined in Section 4.1 and as indicated on his certificate in Section 24.

This Technical Report is an update of the 2009 Technical Report to reflect the Accelerated Development Plan as well as the development of an optimized KOV mining plan. Where Tim Henderson, the Qualified Person for this Technical Report, has relied on the 2009 Technical Report, Mr. Henderson believes it was reasonable to do so.

# 6. PROPERTY DESCRIPTION AND LOCATION

## 6.1. KCC Rights

The mining rights from which KCC, prior to its merger with DCP, is benefiting, originate from Concession No. C23, granted by the DRC State to Gécamines.

Prior to the promulgation of the Mining Code, Gécamines' mining rights for the exploration and exploitation of copper, cobalt and associated mineral substances under Concession No. C23 were granted under the regime of Order-Law No. 67/231 of 11 May 1967 relating to general legislation for mines and hydrocarbons and renewed under the regime of Order-Law No. 81-013 of 2 April 1981 relating to general legislation for mines and hydrocarbons.

Following the entry into force of the Mining Code in 2002, Ministerial Order No.195/CAB/MINESHYDRO/ 01/2002 dated 26 August 2002 recognised Concession No. C23 as valid mining rights belonging to Gécamines and transformed such rights into mining titles under the Mining Code. As part of the transformation process, the areas covered by the Concessions under the former regime were divided into exploitation permits and PE525, originally comprising 400 carrés, was issued having an expiration date of 3 April 2009, being the expiration date of Concession No. C23.

Exploitation permits under the Mining Code are renewable in accordance with the terms of the Mining Code for periods of 15 years.

PE525 covers copper, cobalt and associated mineral substances. PE525 was subsequently reduced to 297 carrés, on 30 December 2005. The land under this exploitation permit covers the area on which the Kamoto Underground Mine is located, the land where the Kamoto, Dikuluwe, Mashamba East, Mashamba West and T17 deposits are located, and the land where the facilities of the Kamoto Underground Mine, the Kamoto Concentrator, the DIMA concentrator and the Luilu Metallurgical Plant.

An exploitation permit grants to its holder the exclusive right to carry out exploration and exploitation works for minerals for which it has been granted. This right covers the construction of necessary facilities for mining exploration, the use of water and wood resources, and the free commercialisation of products for sale, in compliance with corresponding legislation.

Pursuant to the joint venture agreement No. 632/6711/SG/GC/2004 made on 4 February 2004 between Gécamines and KFL and ratified by Presidential Decree No. 05/070 of 4 August 2005

(the "KCC Joint Venture Agreement") and a lease contract ("contrat d'amodiation") No. 716/10518/SG/GC/05 dated 18 October 2005 (the "KCC Lease Agreement"), KCC was granted by Gécamines a lease authorising KCC to exercise the mining rights held by Gécamines under the part of the PE525 covered by the KCC Lease Agreement (subject to the Mining Code and the KCC Joint Venture Agreement). The KCC Lease Agreement was made for a term of 30 years, renewable by mutual agreement in accordance with the terms of the KCC Joint Venture Agreement.

By Ministerial Order No. 1020 dated 17 February 2006, the area covered by PE525 was reduced to 176 carrés and the balance of PE525 was converted into multiple PEs.

By Ministerial Decree No. 3187/CAB.MIN.MINES/01/2007 of 19 September 2007, PE525 was further split at the request of Gécamines into two different permits, namely PE525 consisting of 20 carrés and PE8841 containing most of the balance.

Gécamines had then taken the view that the only areas to be leased to KCC were the mining zones of the Kamoto, Dikuluwe, Mashamba East, Mashamba West, and T17 deposits. In consequence of this, by Ministerial Decree No. 3308/CAB.MIN.MINES/01/2007 of 28 December 2007, Gécamines has had the area of PE525 further reduced, without KCC's prior approval, to 13 carrés. Although the perimeter of PE525, as reduced to 13 carrés, together with two carrés in PE4958, covers the Kamoto, Mashamba East and T17 deposits and mining zones, additional areas were required for dumps, storage and tailings.

Given the changes made by Gécamines to PE525, and the disagreement with KCC which resulted therefrom, the perimeter corresponding to the area covered by the KCC Lease Agreement was not registered with the CAMI.

This matter has now been resolved by the execution of the Amended Joint Venture Agreement (as defined below) and as described in Section 6.3 below. Gécamines agreed in the Amended Joint Venture Agreement: (i) to transfer to KCC the PEs covering the areas leased under the KCC Lease Agreement, and (ii) that KCC would receive an area sufficient for the good functioning of its operations, including spaces for the dams, the future tailings produced by the current activities of KCC, the plants and other necessary premises, as well as the storage areas (the "Necessary Surfaces"), free from third party rights.

Pursuant to an agreement dated 7 February 2008, between Gécamines and KFL (the "Release Agreement"), Gécamines and KFL agreed that KCC would release the Dikuluwe and Mashamba West deposits, covering an area of 7 carrés contained in PE9681, which had been removed from PE525 pursuant to the above mentioned Ministerial Decree No. 3308/CAB.MIN.MINES/01/2007 of 28 December 2007. Following this release, PE525, as reduced to 13 carrés, only covers the deposits of Kamoto and Mashamba East.

Following completion of the Amended Joint Venture Agreement, PE525 has been transferred by Gécamines to KCC by a transfer deed dated 27 July 2009, such transfer being evidenced by the CAMI in the exploitation certificate No. CAMI/CE/4233/2006 dated 27 November 2009. PE525 has been renewed until 3 April 2024, pursuant to Ministerial Decree No. 3180/CAB.MIN.MINES/01/2007 of 30 August 2007. This Exploitation Permit consists of 13 carrés, which comprise the Kamoto Underground Mine.

By Ministerial Decree No. 679/CAB.MINES/MINES/01/2009 of 16 October 2009, the exploitation permit No. 11601 containing 1 carré has been created by division of PE7044 giving Gécamines the right to exploit cobalt, copper, nickel and gold until 7 May 2022. PE11601 has then been transferred by Gécamines to KCC pursuant to a transfer deed dated 27 July 2009, such transfer being evidenced by the CAMI in the exploitation certificate No. CAMI/CE/5622/2009 dated 27 November 2009. This Exploitation Permit comprises the Kananga area.

By Ministerial Decree No. 0676/CAB.MINES/MINES/01/2009 of 16 October 2009, the exploitation permit No. 11602 containing 2 carrés has been created by division of PE4958, giving Gécamines

the right to exploit cobalt, copper, nickel and gold until 3 April 2024 pursuant to Ministerial Decree No. 3215/CAB.MIN.MINES/01/2007 of 21 September 2007. PE11602 was then transferred by Gécamines to KCC pursuant to a transfer deed dated 27 July 2009, such transfer being evidenced by the CAMI in the exploitation certificate No. CAMI/CE/5621/2009 dated 27 November 2009. This Exploitation Permit comprises the T17 Open Pit.

Gécamines has a tailings exploitation permit No. PER9683 covering the 13 carrés now covered by the PE525 although there are no old tailings on this specific area which would interfere with production.

In addition to the KCC Lease Agreement, Gécamines had, pursuant to the KCC Joint Venture Agreement, leased to KCC exclusive rights to use all processing facilities existing on the KCC concession areas (including the Kamoto Concentrator and DIMA Concentrators, and Luilu Metallurgical Plant facilities, together with all their infrastructure and surface), and all mobile equipment. Pursuant to the Amended Joint Venture Agreement, all installations and infrastructures within the perimeter of the KCC concession areas, to the extent required, shall be rented by Gécamines to KCC (following its merger with DCP) with rental being covered by the royalties agreed to by Gécamines and KCC.

**Table 6.1: KCC Mineral and Surface Rights**

| Property | Exploitation Permit Number | Rights Granted | Location | Held By | Area of Title | Valid Until |
|---|---|---|---|---|---|---|
| Kamoto Underground Mine and Mashamba East | PE525 | Cu, Co and associated minerals | 10°43'S, 25°24'E | KCC | 13 blocks, 11,04 km² | 03/04/2024, renewable |
| T17 Open Pit | PE11602 | Cu, Co, nickel and gold | | KCC | 2 blocks, 1,698 km² | 03/04/2024, renewable |
| Extension of Kananga | PE11601 | Cu, Co, nickel and gold | | KCC | 1 block 0,849 km² | 07/05/2022 Renewable |

## 6.2. DCP Rights

Pursuant to a joint venture agreement No. 656/6755/SG/GC/2004 made on 9 September 2004 between Gécamines and Global Enterprises Corporate Limited and ratified by Presidential Decree No. 05/070 of 13 October 2005 (the "DCP Joint Venture Agreement"), Gécamines agreed to transfer certain exploitation permits to DCP and to grant DCP a lease and certain contractual rights over certain facilities. These exploitation permits cover copper, cobalt and associated mineral substances. The land under these exploitation permits comprised, at the time of execution, 32 carrés and covered the copper and cobalt deposits of KOV, Kananga and Tilwezembe.

The ownership of the following exploitation permits has been assigned by Gécamines to DCP:

- Exploitation Permit No. 4961 was assigned by Gécamines to DCP pursuant to a deed of assignment dated 13 January 2006, registered with the CAMI on 2 March 2006. This Exploitation Permit consists of 10 carrés, which comprise the KOV area;
- Exploitation Permit No. 4960 was assigned by Gécamines to DCP pursuant to a deed of assignment dated 13 January 2006, registered with the CAMI on 2 March 2006. This Exploitation Permit consists of 13 carrés, which comprise the Kananga area; and

- Exploitation Permit No. 4963, was assigned by Gécamines to DCP pursuant to a deed of assignment dated 13 January 2006, registered with the CAMI on 2 March 2006. This Exploitation Permit consists of 9 carrés, which comprise the Tilwezembe area;

(collectively the "DCP Exploitation Permits").

The DCP Exploitation Permits have been renewed until 3 April 2024, pursuant to Ministerial Decree No. 0334/CAB.MIN/MINES/01/2009 of 27 May 2009 (for PE4960), Ministerial Decree No. 0332/CAB.MIN/MINES/01/2009 of 27 May 2009 (for PE4961) and Ministerial Decree No. 0333/CAB.MIN/MINES/01/2009 of 27 May 2009 (for PE4963).

Gécamines had, pursuant to the DCP Joint Venture Agreement, granted DCP exclusive rights to the rights attached to sites ancillary to the DCP Exploitation Permits, together with the processing facilities existing on the DCP concession areas, as well as the Group West concentrator treatment plant, the electro-refining plant known as "Luilu extension P2", the installations known as "Siege" in Group West, the waste sites and the Luilu Metallurgical Plant, the KOV conveyor, the other equipment at Kolwezi Concentrator, together with all their infrastructure and surface, and all mobile equipment.

Pursuant to the Amended Joint Venture Agreement, Gécamines has agreed that all other installations that were used by DCP within the DCP Exploitation Permits or the Necessary Surfaces (as defined above), to the extent required, shall be rented by Gécamines to KCC (following its merger with DCP), with rental being covered by the royalties agreed to by Gécamines, KCC and DCP. As part of the discussions relating to the Amended Joint Venture Agreement, the Kolwezi Concentrator was released for the benefit of Gécamines by an agreement dated 25 July 2009. Gécamines has re-engaged its former employees as a result of this restitution.

As a result of the completion of the KCC/DCP merger, all assets (including the mining rights) and liabilities of DCP will be transferred to KCC. This should occur very shortly since favourable opinions of the CAMI regarding the transfer of the exploitation permits of DCP to KCC have already been issued.

**Table 6.2: DCP Mineral and Surface Rights**

| Property | Exploitation Permit Number | Rights Granted | Location | Held By | Area of Title | Valid Until |
|---|---|---|---|---|---|---|
| KOV Open Pit | PE4961 | Cu, Co and associated minerals + Use of Surface | 10°42'S, 25°25'E | DCP (in the process of being transferred to KCC) | 10 blocks, 8,49 km² | 03/04/2024, renewable |
| Tilwezembe Open Pit | PE4963 | Cu, Co and associated minerals + Use of Surface | 10°47'S, 25°42'E | DCP (in the process of being transferred to KCC) | 9 blocks, 7,64 km² | 03/04/2024, renewable |
| Kananga Mine | PE4960 | Cu, Co and associated minerals + Use of Surface | 10°40'S, 25°28'E | DCP (in the process of being transferred to KCC) | 13 blocks, 11,04 km² | 03/04/2024, renewable |

## 6.3. DRC Mining Review

In April 2007, a commission (the "Commission") was formed by the DRC Government to review approximately 60 mining agreements entered into by para-statal companies of the Congolese Government. The KCC Joint Venture Agreement and the DCP Joint Venture Agreement were included in the mining agreements to be reviewed.

The Commission provided its conclusions in its report made public in November 2007.

KCC and DCP were notified on 11 February 2008 by the DRC Ministry of Mines of the objections and requirements regarding their partnerships with Gécamines further to the above-mentioned November 2007 report.

In July 2008, Gécamines and KFL entered into a memorandum of understanding under which they agreed to enter into an amended joint venture agreement and to the merger of KCC and DCP.

In August 2008, the DRC Ministry of Mines issued terms of reference for the renegotiations and/or termination of the mining contracts entered into by KCC and DCP.

Following a number of meetings during the course of the last quarter of 2008 and the first quarter of 2009, Gécamines, KFL Limited and Global Enterprises Corporate Ltd. ("GEC"), in the presence of KCC, DCP, SIMCO, Katanga Mining Holdings Limited, Katanga Mining Finance Limited and KML (BVI) Holdco Ltd. entered into on 25 July 2009 (which is also its date of entry into force) an agreement (the "Amended Joint Venture Agreement") which resulted in the termination of the original KCC Joint Venture Agreement and DCP Joint Venture Agreement.

## 6.4. Consequences of the Amended Joint Venture Agreement on KML's mining rights and equipment and installations

As part of the Amended Joint Venture Agreement, it was agreed that:

- The whole of PE525 (comprising 13 carrés) and part of PE4958 (i.e. new PE11602 described above and comprising two carrés containing the T17 deposit) shall be transferred to KCC. The Kamoto, Mashamba East and T17 deposits and any extensions of these deposits which are within the perimeter of PE525 and the two carrés of PE4958 to be transferred, shall be for the sole benefit of KCC. Such transfer was completed pursuant to a transfer deed dated 27 July 2009 and evidenced by the CAMI in its exploitation certificate No. CAMI/CE/5621/2009 dated 27 November 2009.
- The DCP Exploitation Permits shall be transferred to KCC following completion of the merger with DCP. Such transfer is expected to occur very shortly (favourable opinions of the CAMI for the transfer of the exploitation permits of DCP to KCC have already been issued). In addition, one carré of PE 7044 (i.e. new PE11601 being an extension of the Kananga deposit) shall be transferred by Gécamines to KCC once the holder of PE652 has released the carré to be transferred from its tailings area, or earlier if KCC has agreed to grant an easement to the holder of PE652. Such transfer was completed pursuant to a transfer deed dated 27 July 2009 and evidenced by the CAMI in its exploitation certificate No. CAMI/CE/5622/2009 dated 27 November 2009.
- The perimeter of the merged KCC/DCP concession area will contain the Necessary Surfaces.

Pursuant to the Amended Joint Venture Agreement, the Necessary Surfaces will be sourced from PE8841 held by Gécamines and from one carré close to the T17 deposit. Easements shall be granted to enable KCC to establish and maintain operating facilities for the KOV Open Pit waste removal conveyor belt system. KCC shall fund an independent contractor to determine whether

the surfaces identified as potential Necessary Surfaces contain any mineral reserves. Provided no reserves are discovered, the relevant surfaces shall be converted into multiple exploitation permits (where required) and shall be leased to KCC, following its merger with DCP. Should any reserves be discovered in the identified surfaces, the reserves shall be transferred to KCC and shall count as Replacement Reserves (as defined below) under the terms of the Amended Joint Venture Agreement.

In addition, under the Amended Joint Venture Agreement, KCC is granted an option for a period of three years following the merger with DCP to increase the Necessary Surfaces by the five carrés (to be leased) contained in PE8841 if such extension is required for the project. Beyond this three-year period, KCC shall have a pre-emptive right on these five carrés in case Gécamines is willing to transfer or make any part of them available to third parties.

The rent for the Necessary Surfaces (including the five additional carrés if the option is exercised within the 3 year period) amounts to USD 600,000/year. However, KCC, as the merged entity, will remain liable for the payment of the rental tax (22%) which will be in addition to the royalties owed by KCC to Gécamines.

As part of the Amended Joint Venture Agreement, it has also been agreed that upon the winding up or liquidation of KCC, the mining rights and titles of KCC shall revert to Gécamines without further consideration.

Pursuant to the Amended Joint Venture Agreement, Gécamines and KCC shall sign an agreement relating to the lease by Gécamines to KCC of the equipment and installations described in an annex to the Amended Joint Venture Agreement (the "Equipment and Installations"). The rent for the Equipment and Installations payable by KCC to Gécamines is USD 1,200,000/year to be deducted from the royalties owed by KCC to Gécamines. However, KCC will remain liable for the payment of the rental tax (22%) which will be in addition to these royalties.

KCC shall retrocede the Equipment and Installations free of charge to Gécamines upon lawful termination or final expiry of the Amended Joint Venture Agreement.

As part of the Amended Joint Venture Agreement, it has also been agreed that Gécamines grants and/or makes available to KCC, subject to payment of the reasonable maintenance costs, the following rights: (i) the right to use roads, railways, rail routes, waterways, etc; (ii) to avail itself of rights of way, easements, rights to water, etc. and (iii) all the supplementary rights that can facilitate access to or use of the lands involved and the facilities located thereon, which Gécamines enjoys outside the perimeter of the KCC project in so far as the same are necessary or desirable to carry out the project in the most cost effective manner.

## 6.5. Replacement Reserves

Pursuant to the Amended Joint Venture Agreement, the reserves to be replaced in exchange for the Dikuluwe and Mashamba West deposits surrendered to Gécamines pursuant to the Release Agreement (the "Released Deposits") amount to 3 992 185 tonnes of copper and 205 629 tonnes of cobalt.

No "pas de porte" shall be paid to Gécamines in relation to the transfer of the reserves to be transferred to KCC as compensation for the Released Deposits (the "Replacement Reserves").

Pursuant to the Amended Joint Venture Agreement, Gécamines and KCC are also required to jointly scope, implement and manage an exploration programme (the "Exploration Programme") with the object of identifying sufficient Replacement Reserves and transferring them to KCC by no later than 1 July 2015. The Exploration Programme can take place within the perimeters of: (i) the KCC Exploitation Permits (excluding the Kamoto, Mashamba East, Tilwezembe, Kananga, T17

and KOV deposits and any extensions of these deposits), (ii) the Necessary Surfaces, or (iii) in other perimeters belonging to Gécamines.

The Exploration Programme is to be financed by way of a loan from KCC to Gécamines and refunded, without interest, by Gécamines by way of set-off against the royalties and dividends payable by KCC.

If any Replacement Reserves are identified by Gécamines as a result of the Exploration Programme or otherwise, they shall be evaluated and certified in accordance with the Australasian Code for Reporting of Mineral Resources and Ore Reserves prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Mineral Council of Australia, as amended.

Once Gécamines has satisfied KCC that it has good legal title to such Replacement Reserves and they are covered by valid Exploitation Permits, KCC shall enter into a transfer deed or a lease, pursuant to which the Replacement Reserves shall be transferred or leased (amodié) to KCC.

If Gécamines does not replace these Released Deposits by 1 July 2015 it must pay USD 285,000,000 as financial compensation. KFL, GEC and Gécamines agreed that the financial compensation would be due from 1 July 2015 and that interest would be changed if the financial compensation is not paid within the two months following 1 July 2015. During the first 12 months following the two month grace period the interest rate applicable to the unpaid financial compensation amount would be limited to Libor (6 month) as opposed to Libor (6 month) + 300 basis points which will become applicable as of the end of the 12 month period.

Gécamines accepts that KCC may withhold any future revenues owed to Gécamines (i.e. royalties and dividends, with the exception of the pas de porte) until the financial compensation is fully paid.

## 6.6. Property Boundaries

The property boundaries of the exploitation permits transferred to KCC by Gécamines and shortly by DCP are described in Figures 6.6.1 and 6.6.2 below. Such Figures also show the Necessary Surfaces.

The boundaries have been taken from the maps at the CAMI relating to the boundaries of the DCP Exploitation Permits. KML has not separately surveyed the area. There are certain limited areas outside land currently held by Gécamines where KCC will need to make application for licences to operate infrastructure and tailings.

**Figure 6.6.1: Geographical Location Map of the Material Assets**

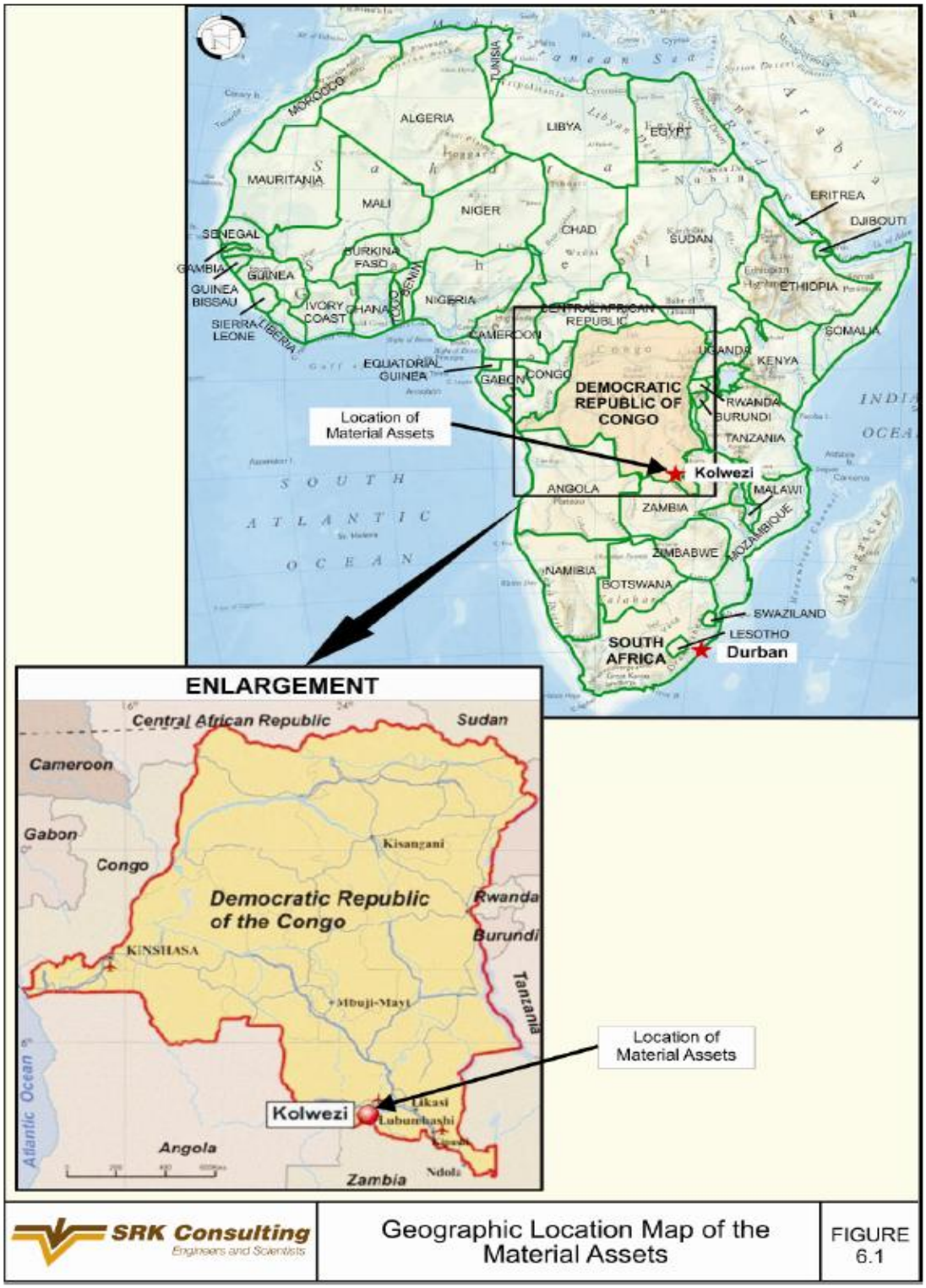
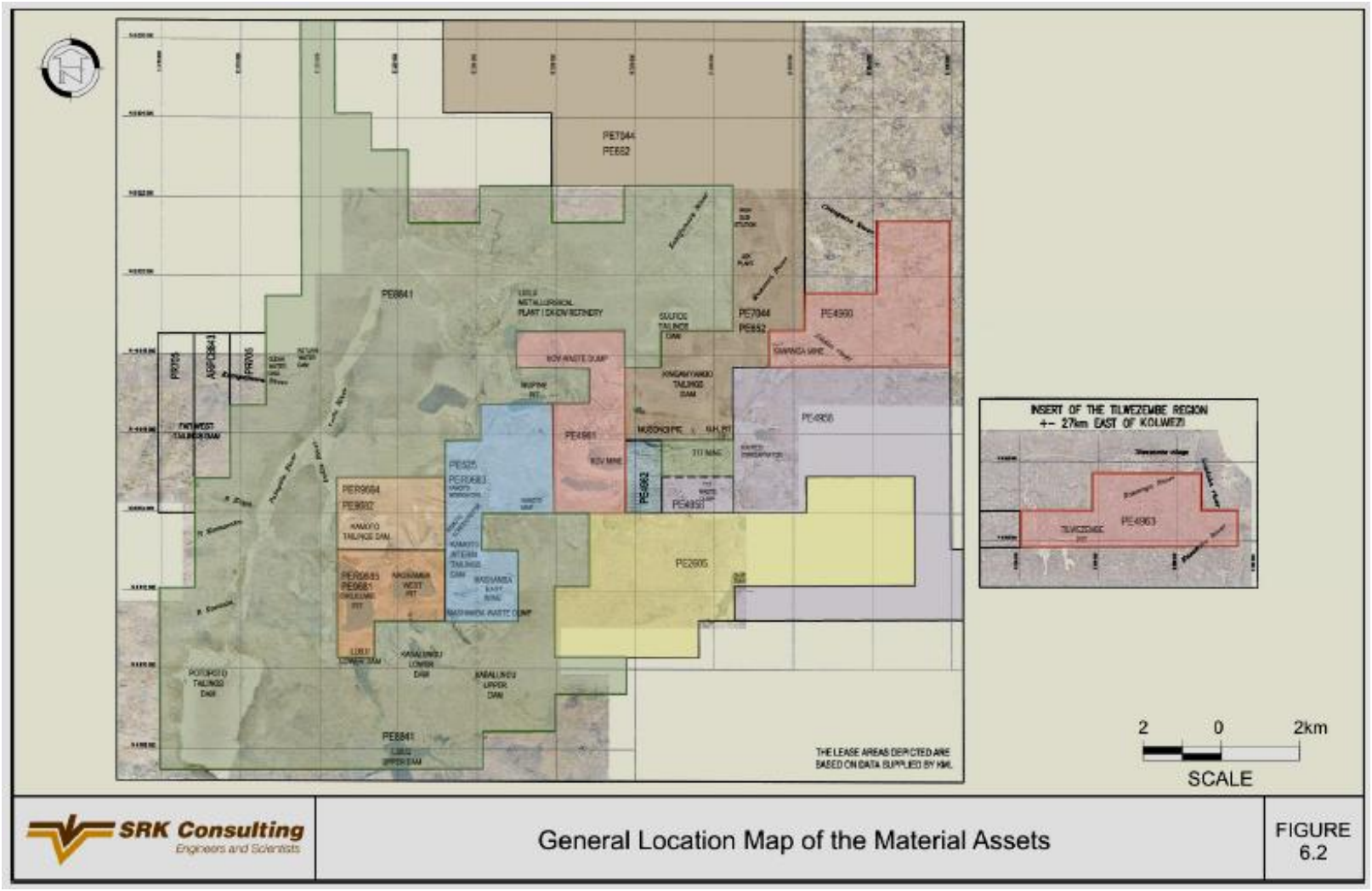


**Figure 6.6.2: General Location Map of the Material Assets**



## 6.7. Royalties, Duties and Other Fees

### Royalties Payable to the State

The holder of a mining exploitation title is subject to mining royalties which are calculated on the basis of the amount of sales minus the costs of transport, the costs of analysis concerning the quality control of the commercial product for sale, the cost of insurance and costs relating to the sale transaction. The royalties are due upon the sale of the product. The mining royalties are 2% for non ferrous metals.

### Surface rights fees payable to the State

Under Article 198 of the Mining Code, KCC and DCP are required to pay surface rights fees of USD 5 per hectare per year or USD 424,78 per carré for exploitation permits.

Additional surface rights fees are payable by KCC as the merged entity holder of exploitation mining rights to the central government of the DRC pursuant to Article 238 of the Mining Code at the rate of USD 0,08 per hectare.

### Royalties payable to Gécamines

Under the KCC Joint Venture Agreement, KCC was required to pay Gécamines for the use of the equipment and facilities a sum equal to 2% of the net sales proceeds realized during the first three annual periods and 1,5% of the net sales proceeds thereafter.

Under the DCP Joint Venture Agreement, DCP was required to pay Gécamines for the transfer of the Exploitation Permits and the use of the ancillary sites and processing installations a sum equal to 2% of the net sales proceeds realized during the first four years and 1,5% of the net sales proceeds thereafter.

Under the Amended Joint Venture Agreement, it was agreed that the royalty rate for equipment and facilities provided by Gécamines as well as for ore reserve depletion will increase from 1,5% to 2,5% of net revenues. "Net revenues" are to be determined on the same basis royalties are calculated under Article 240 of the Mining Code, namely sales less transportation costs, quality control costs, insurance costs and marketing costs.

### Pas de porte payable to Gécamines

A "pas de porte" ("entry premium") payment shall be payable by KFL/GEC to Gécamines for access to the project. The total amount shall be USD 140 million, the payment of which will be completed as follows:

- USD 5 million previously paid by GEC to Gécamines as a loan, being converted into a pas de porte and therefore non-refundable.
- USD 135 million to be paid by KFL. This will comprise:
    - USD 24,5 million to be paid by way of set-off against the amount of the advance to be granted by KFL to Gécamines for payment of the subscription price.
    - USD 5 million to be paid as soon as PE525, PE11601 and PE11602, described in Section 6.1 above, are effectively transferred to KCC.
    - USD 10 million on an annual basis between 2009 and 2011 and USD 15 million on an annual basis between 2012 and 2015, with a final payment in 2016 of USD 15,5 million. The parties have agreed that these amounts shall be paid without any deductions or set off.

No further pas de porte will be payable in respect of the Replacement Reserves; however, any additional tonnage brought by Gécamines to KCC as the merged joint venture after the Released Deposits have been fully compensated will incur a new pas de porte payment of USD 35/t copper.

### Customs duties and taxes payable

There is a requirement to pay customs duties and taxes in accordance with the law.

# 7. ACCESIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

There has been no material change from the Accessibility, Climate, Local Resource, Infrastructure and Physiography of the Material Assets disclosed in the 2009 Technical Report.

# 8. HISTORY

There has been no material change in the History of the Material Assets disclosed in the 2009 Technical Report, except as described in Section 6 and for the following chronological developments:

**Table 8: Historical Production During 2009**

| | |
|---|---|
| Kamoto Underground Mine Production during 2009 | 1 094 kt |
| Cu Grade | 3,85% |
| Co Grade | 0,49% |
| T17 Open Pit Production during 2009 | 1 688 kt |
| Cu Grade | 1,30% |
| Co Grade | 0,85% |
| Kamoto Concentrator Production During 2009 | |
| Oxide Concentrate | 97 495 t |
| Cu Grade | 16,95% |
| Co Grade | 3,76% |
| Sulphide Concentrate | 88 212 t |
| Cu grade | 40,70% |
| Co grade | 5,04% |
| Luilu Metallurgical Plant during 2009 | |
| Cu cathode | 41 964 t |
| Co cathode | 2 535 t |
| Cu in Concentrate | 1 773 t |

# 9. GEOLOGICAL SETTING

There has been no material change from the Geological Setting of the Material Assets disclosed in the 2009 Technical Report.

# 10. DEPOSIT TYPES

There has been no material change from the Deposit Types of the Material Assets disclosed in the 2009 Technical Report.

# 11. MINERALIZATION

There has been no material change from the Mineralization of the Material Assets disclosed in the 2009 Technical Report.

# 12. EXPLORATION

No exploration of the Material Assets has been undertaken on behalf of KML.

# 13. DRILLING

KML has mostly historical information for the project area obtained from diamond drilling conducted by the previous owners, Gécamines. Prior to 2009, there has been limited drilling within the project area for KML and only within Tilwezembe Open Pit, Kananga Mine and KOV Open Pit. During 2009 there was in-fill drilling in Kamoto Underground Mine and at KOV Open Pit.

At Kamoto Underground Mine, the drilling campaign commenced in August 2009 and took place at Etang North and Zone 1 ore bodies.

At KOV Open Pit, the drilling campaign commenced in August 2009 and took place in Kamoto East (four boreholes) and in Oliveira and Virgule (nine boreholes). Table 13 below provides details of the metres drilled during 2009.

**Table 13: Summary Table of Metres Drilled During 2009**

| | Ore Body | Metres |
|---|---|---|
| Kamoto Underground Mine | Etang North/Zone 1 | 4 238,0 |
| KOV Open Pit | Kamoto East | 1 151,2 |
| KOV Open Pit | Oliveira and Virigule | 1 134,0 |
| **Total** | | **6 523,2** |

The drilling campaign objective was to confirm contacts, geometry and grades of the ore bodies in order to provide accurate geological information for KOV Open Pit Cut 1 and will continue in 2010.

# 14. SAMPLE METHOD AND APPROACH

Sampled zones are selected based on the visual observation of the lithological contracts. The geologist also marks on the core the direction along which the core should be split, after considering the attitude of the beddings or foliation relative to the core axes. The drill lengths and the recoveries are recorded in the sampling notebooks.

Sampling is carried out at a maximum of one metre drill length intervals and different stratigraphic units are sampled separately. The core samples are sawed into two halves. One half is broken up and bagged for assay while the other half is stored for future reference.

Core bags for a particular batch are pre-labelled and arranged in order from the first to the last sample. A tag with an identification or sample number is added to the bag containing the sample before the bag mouth is tied.

Split core sampling is done from the drill core. Prior to taking samples, the geologist examines the core and marks off the intervals to be sampled by drawing a line along the core with a marker pen. When the intervals have been selected, the core is split in half using a diamond saw or core splitter. Once the core is split; individual sample lengths are selected taking care to note stratigraphical and lithological boundaries. The whole width of mineralization and at least one metre of apparently barren or low grade hanging wall and foot wall material are covered.

The data is recorded as preliminary in the log sheets and is then transferred into the geological database "GDMS".

Refer to Table 13 above for certain details regarding the locations and other information regarding drilling undertaken.

# 15. SAMPLE PREPARATION, ANALYSIS & SECURITY

KCC carries out the sample preparation at Luilu Laboratory (accreditation and certification of the Laboratory to ISO standards is planned for 2010).

Each of the half core samples are crushed to ± 20 mm and then again crushed to ± 5 mm. The crushed sample is split where necessary to produce a portion about 250 g. The split is then pulverized to 50µ, bagged and labelled. It is then submitted to the Laboratory for its respective analysis.

## 15.1. Laboratory Analysis

The analytical method used for the determination of total copper, total cobalt and copper oxide is atomic absorption spectrometry ("AAS").

## 15.2. Analysis of Acid Soluble Copper and Cobalt

Acid soluble copper and cobalt is determined by acid digestion in a blend of nitric acid and hydrochloric acid. Analysis of the solution is by AAS.

## 15.3. Analysis of Total Copper and Total Cobalt

Each sample is weighed and mixed with an aliquot of blended nitric acid and hydrochloric acid in a volumetric flask. The sample residue is filtered out of solution, made up to volume and analysed for copper and cobalt by AAS.

## 15.4. Analysis of Copper Oxide

Each sample is weighed and mixed in a blend of ethanol, hydrated tin chloride and hydrofluoric acid. This mixture is agitated at the room temperature for a set period and the sample residue filtered out of the solution. The solution is made up to volume and analysed for copper oxide by AAS.

# 16. DATA VERIFICATION

Data validation which is a routine exercise for KCC, involves checking of hardcopies of printed data, 3D computer validation, and on screen checks in Datamine and Surpac. In addition,

physical checks of collar and survey are done by plotting the processed data in section and on plan.

The database system employed at KCC is GDMS which has a built-in data security system. This prevents issues such as data overlaps, duplicates and gaps.

## 16.1. Quality Control and Quality Assurance ("QA/QC")

Quality assurance and quality control is the methodology by which confidence levels are measured and maintained for assaying.

The main objectives of QA/QC programs are to:

1. minimize bias from sampling and assaying;
2. ensure the accuracy and precision of assaying; and
3. measure and demonstrate data integrity and validity for resource estimates and Grade Control.

## 16.2. QA/QC Procedure

The QA/QC procedure involves insertion of blanks, duplicates and standard reference material at pre determined and sequential intervals. Every tenth sample is a blank, every twentieth is a duplicate and every thirtieth sample is a standard reference material with known mean and standard deviations. This cycle is repeated till the end of the hole.

KCC use three types of standard reference material; low, medium and high grade material. This ensures the full range of grade categories of both copper and cobalt are covered.

The reference material assays provide a method by which analytical accuracy is monitored and quantified. There are two parametres of interest when reporting analytical accuracy:

1. the relative assay deviation from the expected value of the reference material; and
2. the average bias over time.

The deviation of a reference material's assay is measured and expressed as a relative standards deviation, thus making it possible to directly compare reference materials with different standard deviations. Acceptable limits are considered to be 95% of samples submitted to be within ± two standard deviations.

When acceptable limits for reference materials are not achieved the following course of actions are taken:

1. cross-check KCC reference material assays with laboratory submitted reference material assays for the same period and/or batch;
2. in the case of bias, determine if it is one reference material type or all reference material types; and
3. after discussions with the Laboratory, an experiment may be undertaken to determine the reason for the variance.

# 17. ADJACENT PROPERTIES

The Qualified Person for this Technical Report is not aware of any public disclosure by an owner or operator of a property adjacent to the Material Assets regarding such adjacent properties which is material to this Technical Report.

# 18. MINERAL PROCESSING AND METALLURGICAL TESTING

The primary body of text in this Section remains substantially unchanged from the equivalent Section in the 2009 Technical Report. For the purpose of this Technical Report, the Qualified Person responsible is Tim Henderson, a consultant to KML. Mr. Henderson is a Qualified Person within the meaning of N1 43-101.

## 18.1. Previous KOV Testwork

### 18.1.1. Samples Tested

The process design criteria primarily assumes that the ore mined from the KOV Open Pit will be the same as the sample used for the DCP testwork at Mintek in 2006, in terms of its milling, flotation, leach and other metallurgical characteristics but different in terms of sulphide copper content. The DCP testwork utilized bulk ore samples of the following five lithological units identified at KOV Open Pit and taken from stockpiles of ore mined just before the mine closed in 1999:

- SDB surface material consisting mainly of oxidised material referred to as SDB Ox but also a sulphide fraction called SDB Sulph;
- RSC;
- RSF;
- D Strat; and
- RAT Grise, the deepest material.

Such samples would presumably have been representative of the material being mined at the time but, in the light of the anticipated change in the proportion of sulphides, such samples are unlikely to be fully representative of future ore to be mined. In addition, it is uncertain to what extent the metallurgical characteristics of the stockpiled ore had changed since being mined. In SRK's view it would have been preferable to have conducted testwork on fresh samples of ore to be mined over the life of project. At the time the difficulty of obtaining such representative samples, due to the pit being flooded, precluded this.

### 18.1.2. Milling Testwork

JKTech (Pty) Ltd. ("JKTech") was commissioned to conduct drop weight testing of the five ore types and to simulate single-stage SAG milling versus primary SAG mill and secondary Ball milling. Generally, all material types were characterised as being "soft to very soft" in terms of resistance to impact breakage and abrasion breakage. However, RAT Grise showed evidence of bimodality in its relative density distribution, which strongly suggests that a dense component could concentrate in the mill load and compromise mill performance. It will therefore be important to ensure a good blend of feed materials to minimise such effects.

JKTech simulation results concluded that a two-state SAG and ball mill circuit was more efficient than a single stage SAG circuit. The two-stage circuit was accordingly incorporated into the DCP flowsheet.

### 18.1.3. Hydrometallurgical Testwork

Mintek undertook a programme of testwork including mineralogy and copper and cobalt hydrometallurgical processing. The test programme was conducted on a composite sample of the five identified lithologies blended pro rata to the depth of the lithological units. Copper and

cobalt leaching, copper solvent extraction ("SX") and copper electro-winning ("EW") were conducted at bench and pilot scale whilst cobalt purification and precipitation investigations were conducted at bench scale on pilot-generated and synthetic solutions.

The leach was conducted in two steps, with pH being maintained with sulphuric acid addition in the first part and the redox potential being controlled in the second part by introducing sulphur dioxide gas. The pilot plant achieved fairly consistent copper and cobalt leaching efficiencies up to 92% and 91% respectively. During pilot testing, the SX circuit was simplified to comprise 2 extraction, 1 wash and 1 strip stages. Cathode produced in the pilot plant achieved the desired LME Grad 'A' quality of >99.95% copper, although attention will have to be given to certain impurities during full-scale operation.

Investigations into the purification and precipitation of cobalt bleed solution included the following steps:

- Fe/Mn removal with air/$SO_2$;
- Removal of aluminium and copper via precipitation with lime;
- Calcination testwork on the final $Co(OH)_2$ product with lime; and
- Precipitation of $Co(OH)_2$ salt using MgO.

The testwork identified optimum conditions for the removal of iron, manganese, aluminium and copper. Properly controlled, cobalt losses should not exceed 1% of Fe/Mn precipitation and 2% in Al/Cu precipitation.

Initial tests were conducted with an industry recognised MgO, whilst optimisation tests were conducted with an alternate MgO that was preferred for the project. Complete cobalt precipitation was achieved with MgO. Unfortunately MgO as a precipitant provided no selectivity for cobalt over nickel, zinc and copper present in the feed, underlining the need to remove these effectively during the purification steps. Furthermore it was not possible to prepare solids with the desired composition of approximately 40% cobalt with <2% co-precipitated magnesium. It is suspected that this was due to very slow kinetics displayed by the alternate MgO and further tests using the industry recognised MgO were recommended. Such tests have since been successfully completed.

## 18.2. Recent KOV Open Pit Testwork

### 18.2.1. Milling Testwork

Mintek was commissioned to further investigate the amenability of the KOV Open Pit ore to autogenous milling, with a view to using the two existing DIMA AG mills at the Kamoto Concentrator rather than the new SAG and ball mills ordered by DCP. Testwork was carried out on drill core samples from 4 ore zones, namely RSC, OBI, OBS-SDB and OBS-SDS in the KOV Open Pit. Based on the ratio of Bond Rod Mill Work Index to Bond Ball Mill Work Index, it was again concluded that the ore is not amenable to fully autogenous milling. This was in line with the earlier JKTech investigations. However, it was also concluded that the DIMA mills could achieve the required KOV ore throughput if converted to SAG milling in series with the existing ball mills.

### 18.2.2. Flotation Testwork

Flotation testwork for the DCP project was originally done at Mintek on a leach residue sample of a largely oxidised ore. It is now anticipated that future KOV Open Pit ore will be increasingly sulphidic and a further programme of testwork has recently been carried out at Mintek in order to finalize process design criteria for the new sulphide float ahead of whole ore leach. This work has confirmed the preliminary flotation plant design used by Bateman Engineering and also confirmed the preliminary reagent suite.

## 18.3. Oxide/Sulphide Content

Oxides and sulphides require different processing routes. It has been assumed that the oxide sulphide ratio for the ore mined from KOV Open Pit is 60%:40%. Should this ratio be significantly different to this assumption, it will affect the capacity of each process route and may restrict production, which will affect sulphur consumption and costs.

## 18.4. Metallurgical Testing

### 18.4.1. Kamoto Concentrator

Mintek undertook an evaluation of mill throughput of a grinding circuit for KOV copper cobalt ore by laboratory tests.

These tests indicated that the optimal circuit configuration would be an open circuit SAG mill followed by a closed circuit ball mill.

The tests determined that three existing ball mills were under powered for the target throughput and grind size. It was also determined that two new mills, of a defined size and installed power that could become available, could process the target throughput and grind size.

Mintek undertook a Computer Simulation Study to establish the maximum throughput capacity of the KOV grinding circuit treating copper cobalt ore. The model indicated that the major bottleneck limiting throughput capacity was the ball mills.

Other computer simulations on alternative circuit configurations indicated that the circulating loads could cause process instabilities.

Further simulations indicated the preferred option would involve operating the primary mills as SAG mills. Although the power draw of the primary mill motors would remain below the installed power, changes to the mill liners would be required and tests undertaken, with respect to the increased charge mass and impact forces. Recommendations were made regarding pilot AG/SAG milling tests on bulk samples of ore.

### 18.4.2. Luilu Metallurgical Plant

Mintek undertook test work on four process streams from the Luilu Metallurgical Plant. An oxide copper concentrate sample and a cobalt hydroxide sample were leached in the laboratory and compared to a concentrate leach residue sample and cobalt hydroxide leach residue sample obtained for the metallurgical plant.

In this manner, the laboratory leaching efficiencies were compared with the metallurgical plant efficiencies. Recommendations were made to improve the leaching efficiencies and hence, the recoveries.

# 19. MINERAL RESOURCES AND MINERAL RESERVE ESTIMATES

Tim Henderson, the Qualified Person for this Technical Report, relied in part on the Mineral Resource models generated by certain of the independent consultants who prepared the 2009 Technical Report when estimating the Mineral Resources and Mineral Reserves.

## 19.1. Consolidated Mineral Resources Statement

Table 19.1 below presents KCC/DCP's consolidated Mineral Resource statement as of 31 December 2009.

**Table 19.1: KCC/DCP Mineral Resources as at 31 December 2009**

| Resource Classification | Project Area | Mt | % T Cu | % T Co |
|---|---|---|---|---|
| **Measured** | Kamoto Underground Mine | 32,0 | 4,51 | 0,58 |
| | **Sub Total** | **32,0** | **4,51** | **0,58** |
| **Indicated** | Kamoto Underground Mine | 35,7 | 4,69 | 0,60 |
| | T17 Open Pit | 11,7 | 3,41 | 0,67 |
| | KOV Open Pit | 126,9 | 5,33 | 0,40 |
| | Mashamba East Mine | 75,0 | 1,80 | 0,38 |
| | Tilwezembe Open Pit | 9,0 | 1,89 | 0,60 |
| | Kananga Mine | 4,1 | 1,61 | 0,79 |
| | **Sub Total** | **262,4** | **3,97** | **0,45** |
| **Measured and** | Kamoto Underground Mine | 67,7 | 4,60 | 0,59 |
| **Indicated** | T17 Open Pit | 11,7 | 3,43 | 0,67 |
| | KOV Open Pit | 126,9 | 5,33 | 0,40 |
| | Mashamba East Mine | 75,0 | 1,80 | 0,38 |
| | Tilwezembe Open Pit | 9,0 | 1,89 | 0,60 |
| | Kananga Mine | 4,1 | 1,61 | 0,79 |
| **TOTAL** | | **294,4** | **4,03** | **0,46** |
| **Inferred** | Kamoto Underground Mine | 10,6 | 5,22 | 0,53 |
| | T17 Open Pit | 15,3 | 1,91 | 0,61 |
| | KOV Open Pit | 71,2 | 3,56 | 0,32 |
| | Mashamba East Mine | 65,3 | 0,76 | 0,10 |
| | Tilwezembe Open Pit | 13,1 | 1,80 | 0,62 |
| | Kananga Mine | 4,0 | 2,00 | 0,98 |
| **TOTAL** | | **179,5** | **2,34%** | **0,31%** |

(1) Mineral Resources have been reported in accordance with the classification criteria of the SAMREC Code.
(2) Mineral Resources are inclusive of Mineral Reserves.
(3) Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.

## 19.2. Comparison of the 2009 and 2008 Mineral Resources

In Tables 19.2.1, 19.2.2, 19.2.3 below, the 2009 Mineral Resources for the KCC/DCP assets are compared with those declared in 2008.

**Table 19.2.1: KCC/DCP: Comparison of the 2009 and 2008 Mineral Resources**

| | | 2009 | | | 2008 | | |
|---|---|---|---|---|---|---|---|
| **Classification** | **Project Area** | **Mt** | **% T Cu** | **% T Co** | **Mt** | **% T Cu** | **% T Co** |
| **Measured** | Kamoto Underground Mine | 32,0 | 4,51 | 0,58 | 33,0 | 4,50 | 0,58 |
| | Sub Total | 32,0 | 4,51 | 0,58 | 33,0 | 4,50 | 0,58 |
| **Indicated** | Kamoto Underground Mine | 35,7 | 4,69 | 0,60 | 35,7 | 4,69 | 0,60 |
| | T17 Open Pit | 11,7 | 3,41 | 0,67 | 13,7 | 3,16 | 0,64 |
| | KOV Open Pit | 126,9 | 5,33 | 0,40 | 126,9 | 5,33 | 0,40 |
| | Mashamba East Mine | 75,0 | 1,80 | 0,38 | 75,0 | 1,80 | 0,38 |
| | Tilwezembe Open Pit | 9,0 | 1,89 | 0,60 | 9,0 | 1,89 | 0,60 |
| | Kananga Mine | 4,1 | 1,61 | 0,79 | 4,1 | 1,61 | 0,79 |
| | Sub Total | 262,4 | 3,97 | 0,45 | 264,4 | 3,96 | 0,45 |
| **Measured and Indicated** | Kamoto Underground Mine | 67,7 | 4,60 | 0,59 | 68,7 | 4,60 | 0,59 |
| | T17 Open Pit | 11,7 | 3,43 | 0,67 | 13,7 | 3,16 | 0,54 |
| | KOV Open Pit | 126,9 | 5,33 | 0,40 | 126,9 | 5,33 | 0,40 |
| | Mashamba East Mine | 75,0 | 1,80 | 0,38 | 75,0 | 1,80 | 0,38 |
| | Tilwezembe Open Pit | 9,0 | 1,89 | 0,60 | 9,0 | 1,89 | 0,60 |
| | Kananga Mine | 4,1 | 1,61 | 0,79 | 4,1 | 1,61 | 0,79 |
| **TOTAL** | | **294,4** | **4,03** | **0,46** | **297,4** | **4,02** | **0,46** |
| **Inferred** | Kamoto Underground Mine | 10,6 | 5,22 | 0,53 | 10,6 | 5,22 | 0,53 |
| | T17 Open Pit | 15,3 | 1,91 | 0,61 | 16,7 | 1,77 | 0,64 |
| | KOV Open Pit | 71,2 | 3,56 | 0,32 | 71,2 | 3,56 | 0,32 |
| | Mashamba East Mine | 65,3 | 0,76 | 0,10 | 65,3 | 0,76 | 0,10 |
| | Tilwezembe Open Pit | 13,1 | 1,80 | 0,62 | 13,1 | 1,80 | 0,62 |
| | Kananga Mine | 4,0 | 2,00 | 0,98 | 4,0 | 2,00 | 0,98 |
| **TOTAL** | | **179,5** | **2,34** | **0,31** | **180,9** | **2,32** | **0,31** |

**Table 19.2.2: KCC/DCP: Kamoto Underground Depletion of Resources from 1 January 2009 to 31 December 2009**

| Classification | Mt | % T Cu | % T Co |
|---|---|---|---|
| **Measured** | | | |
| As at 31 December 2008 | 33,0 | 4,5 | 0,58 |
| Mined | 1,0 | 4,22 | 0,43 |
| As at 31 December 2009 | 32,0 | 4,51 | 0,58 |
| **Indicated** | | | |
| As at 31 December 2008 | 35,7 | 4,69 | 0,60 |
| As at 31 December 2009 | 35,7 | 4,69 | 0,60 |
| **Inferred** | | | |
| As at 31 December 2008 | 10,6 | 5,22 | 0,53 |
| As at 31 December 2009 | 10,6 | 5,22 | 0,53 |
| **Total of Measured, Indicated and Inferred** | | | |
| As at 31 December 2008 | 79,3 | 4,68 | 0,58 |
| Mined | 1,0 | 4,22 | 0,43 |
| As at 31 December 2009 | 78,3 | 4,69 | 0,58 |

**Table 19.2.3: KCC/DCP T17 Open Pit Depletion of Resources from 1 January 2009 to 31 December 2009**

| Classification | Mt | % T Cu | % T Co |
|---|---|---|---|
| **Measured** | | | |
| As at 31 December 2008 | 0,0 | 0,00 | 0,00 |
| Mined | 0,0 | 0,00 | 0,00 |
| As at 31 December 2009 | 0,0 | 0,00 | 0,00 |
| **Indicated** | | | |
| As at 31 December 2008 | 13,7 | 3,16 | 0,64 |
| Mined | 0,6 | 2,85 | 0,75 |
| Material depleted from Indicated Resources | 1,3 | 1,12 | 0,36 |
| As at 31 December 2009 | 11,8 | 3,41 | 0,67 |
| **Inferred** | | | |
| As at 31 December 2008 | 16,7 | 1,77 | 0,57 |
| Mined | 1,0 | 0,36 | 0,97 |
| Material depleted from Inferred Resources | 0,4 | 0,09 | 0,00 |
| As at 31 December 2009 | 15,3 | 1,91 | 0,62 |
| **Total of Measured, Indicated and Inferred** | | | |
| As at 31 December 2008 | 30,4 | 2,40 | 0,60 |
| Mined from Indicated Resources | 0,6 | 2,85 | 0,75 |
| Material depleted from Indicated Resources | 1,3 | 1,12 | 0,36 |
| Mined from Inferred Resources | 1,0 | 0,36 | 0,97 |
| Material depleted from Inferred Resources | 0,4 | 0,09 | 0,00 |
| As at 31 December 2009 | 27,1 | 2,56 | 0,64 |

Notes:

1. 1,3 Mt was depleted from Indicated Mineral Resources. This tonnage was considered as ore in the 2009 Technical Report but was mined as waste. This represents the leached portion of the ore body.
2. The RSC lithology was considered Inferred Mineral Resources because there was no data available. 0,4 Mt was depleted from the Inferred Mineral Resources. This tonnage was considered as ore in the 2009 Technical Report but was mined as waste. This represents the leached portion of the RSC.

## 19.3. Consolidated Mineral Reserve Statement

Table 19.3 below presents KCC/DCP's consolidated Mineral Reserve Statement as at 31 December 2009.

**Table 19.3: KCC/DCP Mineral Reserves as at 31 December 2009**

| Reserve Classification | Project Area | Mt | % T Cu | % T Co |
|---|---|---|---|---|
| **Proved** | Kamoto Underground Mine | 15,9 | 3,50 | 0,51 |
| | **Sub Total** | **15,9** | **3,50** | **0,51** |
| **Probable** | Kamoto Underground Mine | 19,4 | 3,70 | 0,53 |
| | T17 Open Pit | 2,0 | 2,01 | 0,81 |
| | KOV Open Pit | 90,1 | 4,93 | 0,38 |
| | Mashamba East Mine | 10,2 | 4,39 | 0,52 |
| | Tilwezembe Open Pit | 0,0 | 0,00 | 0,00 |
| | Kananga Mine | 0,0 | 0,00 | 0,00 |
| | **Sub Total** | **121,7** | **4,64** | **0,42** |
| **Total Proved and** | Kamoto Underground Mine | 35,3 | 3,61 | 0,52 |
| **Probable** | T17 Open Pit | 2,0 | 2,01 | 0,81 |
| | KOV Open Pit | 90,1 | 4,93 | 0,38 |
| | Mashamba East Mine | 10,2 | 4,39 | 0,52 |
| | Tilwezembe Open Pit | 0,0 | 0,00 | 0,00 |
| | Kananga Mine | 0,0 | 0,00 | 0,00 |
| **TOTAL** | | **137,6** | **4,51** | **0,43** |

(1) Mineral Reserves have been reported in accordance with the classification criteria of the SAMREC Code.

# 20. OTHER RELEVANT DATA AND INFORMATION

## 20.1. Dewatering of the KOV Open Pit

The KOV Open Pit dewatering system, as designed by Africon, was implemented and was operational from November 2009. At the end of February 2010, approximately 35% of the initial estimated volume of 12 Mt water had been discharged from the KOV Open Pit. The conceptual mine dewatering and pit slope dewatering borehole layout, as designed by AGES, is being reviewed by an independent hydrogeology consultant in consideration of the amended mine plan.

## 20.2. Infrastructure

The consumption of electricity by the various facilities of KCC in Kolwezi required to produce up to 310 ktpa of saleable copper, peaks at 215 MW from Repartiteur Ouest ("RO") substation.

At present, the operations are supplied at 120 KV with the bulk of the new load arising from potential new refinery projects. It is proposed to supply that load from the 220 KV (Station de Conversion) SCK in Kolwezi. For the availability of power KCC has employed an independent consultant, Trans Africa Projects ("TAP") to carry out an independent study of the Congolese Power Grid. Their area of expertise is high voltage transmission (up to 765 kV) mostly gained in South Africa. The reliability of the SNEL network, for the supply of electricity to the KCC facilities was reviewed by TAP. They also provided design services for high voltage infrastructure for the mine.

This Section is based on the TAP Report and an assessment of LoM power requirements, as determined by the Electrical Engineering team at KCC.

The electrical loads are as follows:

- the Luilu Metallurgical Plant will ramp up to 76 MW by 2012 reducing to 64 MW by 2015;
- the Kamoto Underground Mine and Kamoto Concentrator supplied from the Kadi sub station will progressively ramp up to 45 MW by 2015;
- the KOV Open Pit mining and dewatering activities will consume 20 MW in 2010 and 2011 and reduce to 14 MW when the initial pit dewatering activities are completed; and
- the potential new refinery projects for an additional 150 ktpa of copper are estimated to require 60 MW in 2014 and an additional 30 MW in 2015 for a total of 90 MW.

The Katanga HV SNEL network consists of 120 kV and 220 kV hydro electric stations, lines and sub stations. Most of the generation stations, in the Katanga region, are in the Kolwezi area and export their power through the RO or SCK sub stations. The bulk of the 220 kV power arrives at SCK from the DC conversion station which receives 220 kV power from the Inga Hydro Electric Generation Plant near Kinshasa. The two sub stations are linked by a 100 MVA auto transformer which allows 220 kV power to be injected into the 120 kV grid at the Kolwezi RO substation for use in the Katanga network.

KCC has signed a power supply agreement with SNEL to ensure the required power is available to ramp its activities up to 150 ktpa by the end of 2011. This has been achieved by an investment agreement in private/public redevelopment with SNEL and is being managed by KCC and its partners. KCC is presently negotiating to extend its involvement in the private/public agreement beyond the initial investment, in order to achieve reliability of energy supply for its future projects and to ensure that power is available when it is required.

## 20.3. Risk Assessment

The primary body of text in this Section remains substantially unchanged from the equivalent Section in the 2009 Technical Report. For the purpose of this Technical Report, the Qualified Person responsible is Tim Henderson, a consultant to KML. Mr. Henderson is a Qualified Person within the meaning of N1 43-101.

A high level risk assessment was facilitated by CorProfit Systems Africa, which complied with the AS/NZS 4360 Standard used to identify risks and their controls measures. KML continues to assess its operational and project risks and is not currently aware of any impediments to the continuation of operations and the development of its projects.

The risk assessment was undertaken at two workshops on 28 August 2008 and 5 September 2008 involving members from all the disciplines in the Engineering Study. KML's operations and projects are subject to the following material risks:

***Resources: Overstated Resource Estimate for T17 Open Pit***

| | |
|---|---|
| The risk: | The grade estimated for the current workings of the T17 Open Pit may vary from estimates based on the block model. |
| Residual Risk Rating: | High |
| The Consequence: | If grade is overstated, may result in reduced production of copper and cobalt.<br>If grade is understated, may result in increased production of copper and cobalt. |
| Risk Mitigation Measure/s: | No risk mitigation measures identified. |

***Metallurgical Processing: Unavailability and Quality of Key Reagents***

| | |
|---|---|
| The risk: | The unavailability and quality of key reagents (like sulphuric acid and lime) that are required in large quantities and are critical to the metallurgical process. |
| Residual Risk Rating: | High |
| The Consequence: | Reduced production of copper and cobalt. |
| Risk Mitigation Measure/s: | Detailed supply management plan. |

***Services: Poor Condition of Railway Line***

| | |
|---|---|
| The risk: | The poor condition of the railway line will impede efficient production by not allowing the efficient, on-time delivery of finished products or the supply of key input materials on time. |
| Residual Risk Rating: | Very High |
| The Consequence: | Reduced production of copper and cobalt; and<br>Higher logistics costs. |
| Risk Mitigation Measure/s: | Reschedule plans to match rail capacity;<br>Engage with governments and railway operators; and<br>Engage with other potential rail users. |

Resort to the utilization of road transportation but at a higher cost for logistic services.

***Services: Availability of Rolling Stock***

| | |
|---|---|
| The risk: | Rolling stock (locomotives and wagons) will not be available on time to transport the scheduled increases in production of finished products and key input materials. |
| Residual Risk Rating: | Very High |
| The Consequence: | Reduced production of copper and cobalt; and<br>Higher logistics costs. |
| Risk Mitigation Measure/s: | Establish required capacity; and |

| | |
|---|---|
| | Negotiate with SNCC (the rail operator) and other railway groups to increase capacity. |

***Services: Under-developed in-country institutional infrastructure and capacity***

| | |
|---|---|
| The risk: | The DRC national and local governments and their agencies will not have the ability to deliver on the infrastructure requirements of the Project. |
| Residual Risk Rating: | High |
| The Consequence: | Project feasibility and/or viability (NPV and IRR); and<br>Project delay. |
| Risk Mitigation Measure/s: | Develop relationships with other stakeholders, governments and agencies; and<br>Support capacity development initiatives. |

***Services: Lack of Power Supply***

| | |
|---|---|
| The risk: | Power generation will not meet the requirements of the Project as power requirements beyond 2011 require large-scale investment by the DRC government and SNEL. |
| Residual Risk Rating: | High |
| The Consequence: | Project feasibility and/or viability (NPV and IRR). |
| Risk Mitigation Measure/s: | Invest with SNEL in additional power generation transmission and distribution capacity. |

***Environmental: Non-resolution of Liabilities***

| | |
|---|---|
| The risk: | KCC/DCP could be held liable for previous liabilities incurred before operations commenced under current management. |
| Residual Risk Rating: | High |
| The Consequence: | KCC/DCP will inherit the liabilities. |
| Risk Mitigation Measure/s: | Quantify current liabilities and negotiate. |

***Environmental: Non-compliance with DRC Mining Code***

| | |
|---|---|
| The risk: | The risk that the mining and/or environmental licences will be revoked as a result of non-compliance with the DRC mining code. |
| Residual Risk Rating: | High |
| The Consequence: | Loss of licence. |
| Risk Mitigation Measure/s: | Adhere to environmental-management plan. |

***Human Resources: Senior Management and Technical Expertise***

| | |
|---|---|
| The risk: | The inability to recruit and retain senior management and operation-critical technical expertise to manage and operate the mines and processing plants. |
| Residual Risk Rating: | High |
| The Consequence: | Project viability (NPV and IRR); and |

| | |
|---|---|
| | Ability to comply with legislation necessary to ensure the optimal operation of the business. |
| Risk Mitigation Measure/s: | Review the company's employment strategy;<br>Review the recruitment and retention plan; and<br>Facilitate the provision of contractor's services with Government and other service providers. |

***Capital Costs: Unpredictable Escalation of Costs***

| | |
|---|---|
| The risk: | Projects in the mining industry world-wide have recently experienced unpredictable capital cost overruns due to various macroeconomic and microeconomic factors that cannot be predicted with any reliable degree of certainty. |
| Residual Risk Rating: | High |
| The Consequence: | Inaccurate capital cost estimate. |
| Risk Mitigation Measure/s: | Regular review of estimates. |

***Operating Costs: Deviation from Engineering Study Estimates***

| | |
|---|---|
| The risk: | Projects in the mining industry world-wide have recently experienced unpredictable operating cost overruns due to various macroeconomic and microeconomic factors which cannot be predicted with any reliable degree of certainty. |
| Residual Risk Rating: | High |
| The Consequence: | Project viability (NPV and IRR). |
| Risk Mitigation Measure/s: | Include adequate contingency and cost. Run sensitivity models. |

***Mitigation Measures Being Implemented***

As indicated previously, the risk assessment was undertaken at two workshops on 28 August 2008 and 5 September 2008. KML is implementing the follow-up mitigation measures:

- KML has recently hired some experienced environmental professionals with technical expertise in mining operations. In addition, KML employs approximately 100 expatriates and has made, and will continue to make, significant progress on infrastructure development and expansion, which will greatly assist with the recruitment and retention of skilled staff.
- Medical facilities have been expanded and upgraded with further activities in the process of being implemented. A formal malaria-control initiative has been launched and so has a community inoculation program.
- Multiple potable water wells and lines have been installed or rehabilitated and rebuilding of the community road network is under way. Donations to local schools will continue.
- An ongoing audit has elevated health-and-safety awareness and made significant progress in improving working conditions on-site. An ISO-based management system is under development and is being progressively introduced to site operations and a major incident/crisis response plan has been developed under the guidance of recognized experts.
- KML has developed systems and procedures to liaise effectively with the community and stakeholders. In the past year KML has consulted with local stakeholders, invested

in social programs and rehabilitated local infrastructure. The Governor of Katanga region has been supportive of KML's activities.

- Management information systems have been upgraded. To this end, microwave capacity has been upgraded and is now reliable; the reinstallation of an expanded fibre-optic network has been completed and the construction of a secure and stable IT facility is complete; professional IT staff have been hired and the IT staff is being progressively expanded.

# 21. INTERPRETATIONS AND CONCLUSIONS

The results and interpretations of development of the Material Assets are reported elsewhere in this Technical Report and have been relied upon to compile the Mineral Resource statement included in Section 19.

# 22. RECOMMENDATIONS

Recommendations for future work required on the Material Assets are set out below, as well as included in other Sections in this Technical Report.

- Dewatering
  - Additional work is required to confirm the correlation between the hydrogeological model and field observation of data.
  - Additional drilling and pump testing should be undertaken to establish that the RAT does in fact form an impermeable barrier for regional groundwater flow as this is a critical assumption in the model.
  - The model should be updated with the data from drilling currently being undertaken to demonstrate that the aquifer on the eastern side of the Musonoi River is in fact being impacted by the dewatering of KOV Open Pit. This data will be critical in resolving the issue of the source of flow into KOV Open Pit and should be used to refine the dewatering strategy in the future.
- Geotechnical
  - Further studies should be carried out on the rock characteristics associated with the Material Assets.
- Tailings
  - Further studies should be carried out to fully characterise the physical and chemical properties of the tailings streams, investigate the possibility of open end deposition, further investigate the geology and hydrogeology at Mupine Pit and to characterise potential construction materials.
- Scoping and Engineering Study
  - The Scoping and Engineering Study will re-visit the process engineering completed for the 2009 Technical Report with a view towards simplifying process design to ease the integration of existing process systems and infrastructure into the development required for incremental expansion up to 310 ktpa copper. An objective of the Scoping and Engineering Study will be to evaluate the additional mineralogical and metallurgical test work that will be required to verify the accuracy, reliability and validity of information and data used in the 2009 Technical Report or to confirm the technical and economic

viability of any engineering proposed as an alternative to that presented in the 2009 Technical Report.

# 23. REFERENCES

This Technical Report cites reference to "An Independent Technical Report on the Material Assets of Katanga Mining Ltd., Katanga Province, DRC, compiled by SRK Consulting (South Africa) (Proprietary) Ltd. dated 17 March 2009" which is referred to herein as the 2009 Technical Report.

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# 24. DATE AND SIGNATURE PAGE

**CERTIFICATE OF A QUALIFIED PERSON**

I, Tim Henderson, do hereby certify that:

1. I am a consultant to Katanga Mining Limited ("**Katanga**") and I reside at 7 Glencarse Home Farm, Glencarse, Perth PH2 7LF Scotland;

2. This certificate applies to the technical report entitled "A Technical Report on the Material Assets of Katanga Mining Limited" (the "**Report**"), dated March 31, 2010 related to the Kamoto/Mashamba East mine, KOV open pit mine, Kamoto underground mine, and two oxide open pit resources properties in the Kolwezi District of the DRC (the "**Project**");

3. I am a graduate of the Cambourne School of Mines, England with an MSC in Mine Management and Minerals Engineering (1991) and a Dip.CSM, Mining (1975). I am a Chartered Engineer registered with the United Kingdom Engineering Council and I am a member of the Institute of Materials, Minerals and Mining. Since April 2009 I have held the position of Executive Director Operations Southern Africa for Glencore, with responsibility for all mining operations and exploration activities within Zambia and the DRC, and previously held the position of Chief Executive Officer (Zambia) Mopani Copper Mines. I have worked with Katanga since September 2008 and from then until April 2009 held the position of Director General of Kamoto Copper Company. I am a "qualified person" as that term is defined in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101");

4. My most recent personal inspections of the Project properties for purposes of this Report were as follows: one week in March 2010; two weeks in February 2010; and one week in January 2010;

5. I am responsible for preparing or supervising the preparation of each item of the Report;

6. I am not independent of Katanga, as that term is described in Section 1.4 of NI 43-101;

7. My prior involvement with the Project includes my work as the Executive Director Operations Southern Africa for Glencore, with responsibility for all mining operations and exploration activities within Zambia and the DRC which is continuing from April 2009, the Director General of Kamoto Copper Company from September 2008 until April 2009, and the position of Chief Executive Officer (Zambia), responsible for the operations of Mopani Copper Mines;

8. I have read NI 43-101 and the Report has been prepared in compliance with NI 43-101; and

9. As the date of this certificate, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated this 31 day of March, 2010

(Signed) *"Tim Henderson"*

**Tim Henderson**

# 25. ADDITIONAL REQUIREMENTS FOR PRODUCTION PROPERTIES

## 25.1. Mining and Stripping Operations

During 2009, mining activities were carried out in Kamoto Underground Mine and in T-17 Open Pit. KOV Open Pit stripping activities started during the fourth quarter of 2009.

### 25.1.1. Kamoto Underground Mine

Ore production was below budget during 2009 but at a higher copper grade. The total copper content was in line with the budget. A hydraulic backfill system was constructed during 2009 and will be commissioned in early 2010.

Production results for 2009 are as set out in Table 25.1.1.1 below and the LoM production profile is as set forth in Table 25.1.1.2 below. Development metres were behind internal budget but this will not affect future production due to existing development already in place.

**Table 25.1.1.1: Kamoto Underground Mine 2009 Production Results**

| KAMOTO MINE | Unit | Actual | Budget | Variance |
|---|---|---|---|---|
| Development | (m) | 1 165 | 4 502 | -74% |
| Ore | (kt) | 1 094 | 1 177 | -7% |
| Cu | % | 3,85 | 3,54 | 9% |
| | (kt) | 42 | 42 | 0% |
| Co | % | 0,49 | 0,47 | 5% |
| | (kt) | 5 | 6 | -10% |

**Table 25.1.1.2: Kamoto Underground Mine LoM Production Profile (2010 to 2034)**

| | Unit | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ore | (kt) | 1 800 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 |
| Cu | (%) | 3,72% | 3,57% | 3,55% | 3,54% | 3,64% | 3,82% | 3,92% | 3,83% | 3,69% | 3,75% | 3,90% |
| | (kt) | 67 | 77 | 77 | 77 | 79 | 83 | 85 | 83 | 80 | 81 | 84 |
| Co | (%) | 0,40% | 0,45% | 0,45% | 0,45% | 0,57% | 0,64% | 0,65% | 0,63% | 0,60% | 0,54% | 0,52% |
| | (kt) | 7 | 10 | 10 | 10 | 12 | 14 | 14 | 14 | 13 | 12 | 11 |

| | Unit | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ore | (kt) | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 2 160 | 126 | - | - | - | - | - |
| Cu | (%) | 3,80% | 3,73% | 3,78% | 3,78% | 3,69% | 3,73% | 3,72% | 3,40% | 3,30% | - | - | - | - | - |
| | (kt) | 82 | 81 | 82 | 82 | 80 | 81 | 80 | 73 | 4 | - | - | - | - | - |
| Co | (%) | 0,53% | 0,50% | 0,47% | 0,44% | 0,45% | 0,46% | 0,46% | 0,44% | 0,44% | - | - | - | - | - |
| | (kt) | 11 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 1 | - | - | - | - | - |

## 25.1.2. T17 Open Pit

Ore production exceeded budget during 2009 but at lower average copper grade. The total copper content was below budget. Production results for 2009 are set forth in Table 25.1.2.1 below and the LoM production profile is as set forth in Table 25.1.2.2 below:

**Table 25.1.2.1: T17 Open Pit 2009 Production Results**

| T17 | Unit | Actual | Budget | Variance |
|---|---|---|---|---|
| Waste | (kt) | 16 490 | 18 248 | -10% |
| Strip Ratio | (kt) | 9,8 | 12,4 | 21% |
| Ore | (kt) | 1 688 | 1 476 | 14% |
| Cu | % | 1,30 | 1,71 | -24% |
| | (kt) | 22 | 25 | -13% |
| Co | % | 0,85 | 0,82 | 4% |
| | (kt) | 14 | 12 | 18% |

**Table 25.1.2.2: T17 Open Pit LoM Production Profile**

| | Unit | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|
| Waste | (kt) | 7 055 | 1 380 | - | - | - | - | - | - |
| Strip Ratio | (kt) | 5,9 | 3,2 | - | - | - | - | - | - |
| Ore | (kt) | 1 200 | 432 | - | - | - | - | - | - |
| Cu | (%) | 1,54% | 1,54% | - | - | - | - | - | |
| | (kt) | 18 | 7 | - | - | - | - | - | - |
| Co | (%) | 0,71% | 0,70% | - | - | - | - | - | - |
| | (kt) | 8 | 3 | - | - | - | - | - | - |

## 25.1.3. KOV Open Pit

The KOV Open Pit was optimised with a view to achieve the following:

- Initial production of ore to start in 2010 with an accelerated ramp up.
- Reduce the pre-strip requirement and the initial operational open pit strip ratio to provide a positive impact on the cash flow of the projects.
- Kamoto East orebody to be mined using Kamoto Mine underground infrastructure, commencing 2014.
- Mine planning to remain robust and flexible to meet ore requirements to achieve the Accelerated Development Plan to 150 ktpa copper while:
    - optimizing future production and recoverability of resources; and
    - allowing for a further expansion of mining activities to support future production increases to 310 ktpa copper.

Table 25.1.3.1 below is based on the optimised KOV Open Pit Cut 1 production profile for the period 2010 to 2016 and includes ore production from Kamoto East Underground Mine from 2014 onwards. From 2017 onwards, the LoM production profile is derived from the KOV Open Pit Cut 2 production profile which is consistent with the 2009 Technical Report LoM plan for 2017 onwards.

**Table 25.1.3.1: KOV Open Pit LoM Production Profile (2010 to 2034)**

| | Unit | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Waste | (kt) | 23 473 | 24 591 | 22 504 | 22 372 | 49 390 | 47 494 | 47 894 | 46 849 | 46 549 | 47 595 | 45 017 | 45 720 | 50 271 |
| Strip Ratio | (kt) | 18,7 | 16,5 | 6,4 | 6,4 | 10,3 | 9,9 | 10,0 | 9,8 | 9,7 | 9,9 | 9,4 | 9,5 | 10,5 |
| Ore | (kt) | 1 255 | 1 494 | 3 500 | 3 500 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 |
| Cu | (%) | 2,38% | 5,41% | 5,49% | 5,63% | 4,93% | 4,95% | 6,44% | 6,86% | 6,49% | 4,84% | 4,98% | 4,72% | 4,41% |
| | (kt) | 30 | 81 | 192 | 197 | 237 | 237 | 309 | 329 | 312 | 232 | 239 | 227 | 212 |
| Co | (%) | 0,13% | 0,25% | 0,38% | 0,44% | 0,36% | 0,38% | 0,39% | 0,45% | 0,40% | 0,35% | 0,38% | 0,74% | 0,57% |
| | (kt) | 2 | 4 | 13 | 16 | 17 | 18 | 19 | 21 | 19 | 17 | 18 | 35 | 28 |

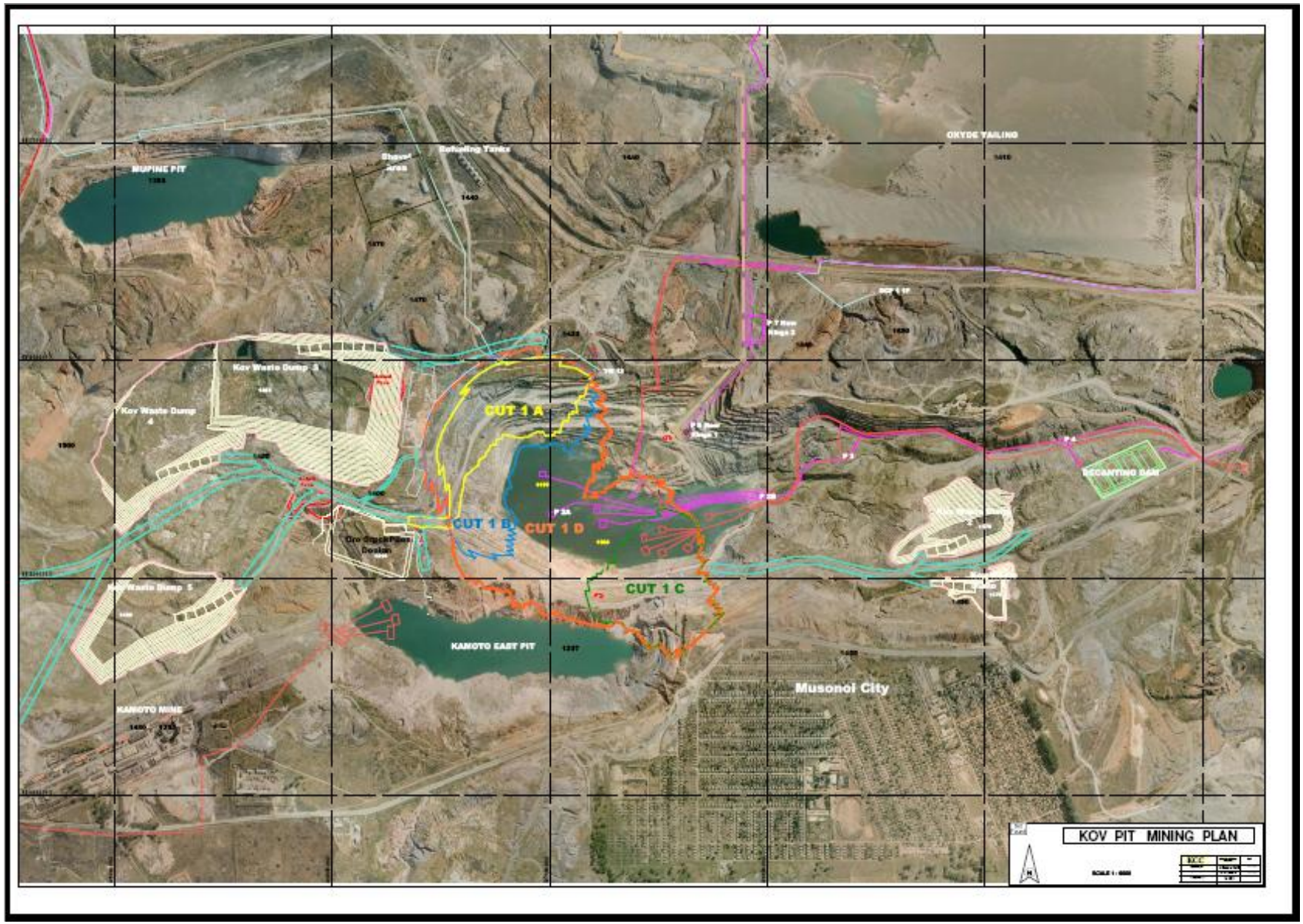
| | Unit | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Waste | (kt) | 43 236 | 44 848 | 56 655 | 66 051 | 56 402 | 55 211 | 53 568 | 33 835 | 22 331 | 22 284 | 21 554 | - |
| Strip Ratio | (kt) | 9,0 | 9,3 | 11,8 | 13,8 | 11,8 | 11,5 | 11,2 | 7,0 | 4,7 | 4,6 | 4,5 | - |
| Ore | (kt) | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 800 | 4 770 | - |
| Cu | (%) | 4,46% | 4,19% | 4,78% | 5,25% | 5,06% | 5,14% | 4,26% | 4,25% | 4,62% | 4,58% | 4,58% | - |
| | (kt) | 214 | 201 | 230 | 252 | 243 | 247 | 205 | 204 | 222 | 220 | 218 | - |
| Co | (%) | 0,50% | 0,64% | 0,56% | 0,36% | 0,39% | 0,33% | 0,41% | 0,44% | 0,29% | 0,29% | 0,28% | - |
| | (kt) | 24 | 31 | 27 | 17 | 19 | 16 | 20 | 21 | 14 | 14 | 13 | - |

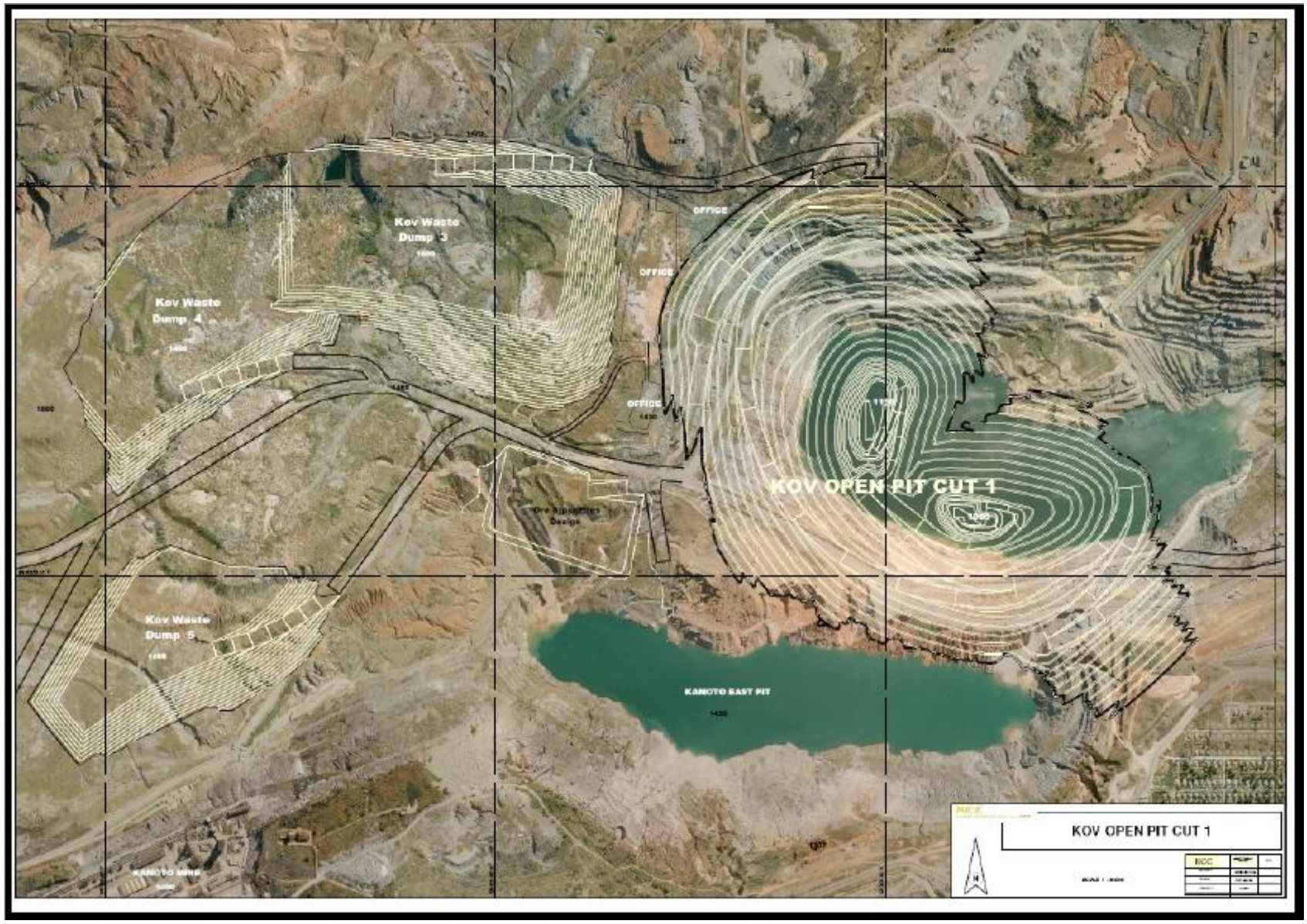
Table 25.1.3.2 below provides certain details of the optimized KOV Open Pit Cut 1 production profile.

**Table 25.1.3.2: Optimised KOV Open Pit Cut 1 Production Profile**

| | **Unit** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **TOTAL** |
|---|---|---|---|---|---|---|---|---|---|---|
| Waste | (kt) | 1 261 | 23 473 | 24 591 | 22 504 | 22 372 | 22 900 | 9 436 | 1 315 | 127 853 |
| Strip Ratio | (kt) | - | 18,71 | 16,46 | 6,43 | 6,39 | 6,54 | 2,70 | 0,45 | 6,49 |
| Ore | (kt) | - | 1 255 | 1 494 | 3 500 | 3 500 | 3 500 | 3 500 | 2 941 | 19 690 |
| Cu | (%) | - | 2,38 | 5,41 | 5,49 | 5,63 | 5,91 | 5,56 | 5,44 | 5,53 |
| | (kt) | - | 30 | 81 | 192 | 197 | 207 | 195 | 160 | 1 088 |
| Co | (%) | - | 0,13 | 0,25 | 0,38 | 0,45 | 0,44 | 0,50 | 0,42 | 0,42 |
| | (kt) | - | 2 | 4 | 13 | 16 | 16 | 18 | 12 | 82 |

Figures 25.1.3.1 and 25.1.3.2 below illustrate the overall mining plan with Cut 1A, 1B, 1C and 1D identified and the planned final profile of KOV Cut 1 including the benches.


MUPINE PIT
OXYDE TAILING
Refueling Tanks
Kov Waste Dump 3
Kov Waste Dump 4
CUT 1 A
CUT 1 B
CUT 1 D
CUT 1 C
DECANTING DAM
KAMOTO EAST PIT
Musonoi City
KAMOTO MINE
KOV PIT MINING PLAN


Kov Waste
Dump 3
Kov Waste
Dump 4
Kov Waste
Dump 5
OFFICE
OFFICE
OFFICE
KOV OPEN PIT CUT 1
KANOTO EAST PIT
KOV OPEN PIT CUT 1

## 25.1.4. Mashamba East Mine

The Mashamba East Mine LoM production profile is set out in Table 25.1.4 below.

**Table 25.1.4: Mashamba East Mine LoM Production Profile (2010 to 2034)**

| | Unit | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Waste | (kt) | - | - | - | - | - | - | - | - | - | 14 655 | 14 813 | 15 053 | 15 284 |
| Strip Ratio | (kt) | - | - | - | - | - | - | - | - | - | 9,8 | 9,9 | 10,0 | 10,2 |
| Ore | (kt) | - | - | - | - | - | - | - | - | - | 1 500 | 1 500 | 1 500 | 1 500 |
| Cu | (%) | - | - | - | - | - | - | - | - | - | 4,35% | 4,40% | 4,45% | 4,51% |
| | (kt) | - | - | - | - | - | - | - | - | - | 65 | 66 | 67 | 68 |
| Co | (%) | - | - | - | - | - | - | - | - | - | 0,35% | 0,38% | 0,40% | 0,40% |
| | (kt) | - | - | - | - | - | - | - | - | - | 5 | 6 | 6 | 6 |

| | Unit | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Waste | (kt) | 15 294 | 16 732 | 18 354 | 15 238 | - | - | - | - | - | - | - | - |
| Strip Ratio | (kt) | 10,2 | 11,2 | 12,2 | 10,2 | - | - | - | - | - | - | - | - |
| Ore | (kt) | 1 500 | 1 500 | 1 500 | 1 500 | - | - | - | - | - | - | - | - |
| Cu | (%) | 4,62% | 4,38% | 4,26% | 4,11% | - | - | - | - | - | - | - | - |
| | (kt) | 69 | 66 | 64 | 62 | - | - | - | - | - | - | - | - |
| Co | (%) | 0,43% | 0,49% | 0,52% | 0,51% | - | - | - | - | - | - | - | - |
| | (kt) | 6 | 7 | 8 | 8 | - | - | - | - | - | - | - | - |

# 25.2. Recoverability

The primary body of text in this Section remains substantially unchanged from the equivalent Section in the 2009 Technical Report. For the purpose of this Technical Report, the Qualified Person responsible is Tim Henderson, a consultant to KML. Mr. Henderson is a Qualified Person within the meaning of N1 43-101.

## 25.2.1. Introduction

As noted in Section 6, prior to January 2008, Nikanor and KML pursued separate projects on adjacent concessions.

Processing assets awarded to Nikanor included the Kolwezi Concentrator and Luilu Electro-refinery. Following a review of these facilities in 2005, it was concluded that it was not viable to rehabilitate them. In June 2006, GEC completed a Definitive Feasibility Study ("DFS") on the DCP on behalf of Nikanor. Processing aspects of the study were sub-contracted to Bateman. The DFS proposed a new hydrometallurgical facility with a capacity of 250 ktpa annum of LME Grade 'A' copper cathode and 30 ktpa of cobalt as a hydroxide salt. Bateman subsequently continued with front-end engineering services for the DCP project including the placement of orders on long-delivery items such as mills, thickeners and an acid plant.

Processing assets awarded to Katanga included the Kamoto Concentrator with a historical capacity of 7,5 Mtpa ore and the Luilu Metallurgical Plant with a nameplate capacity of 175 ktpa copper and 8 ktpa cobalt cathode. In July 2006, KML embarked on Phase 1 of a four-phase rehabilitation programme to return the Kamoto Concentrator and the Luilu Metallurgical Plant to close to the nameplate capacity. Hatch was commissioned to undertake the engineering design and Phase 1 was commissioned in December 2007.

In January 2008, KML merged with Nikanor and KML assumed management responsibility of the combined mining assets through Kamoto Operating Limited. Bateman Engineering was

appointed to undertake an Engineering Study, including the rationalisation of the processing projects for the merged assets where synergies existed. This was completed initially in October 2008 but revised in January 2009 due to adverse developments in the world financial markets.

In September 2009, KML announced its intention to accelerate the ramp up of production to 150 ktpa of copper and 8 ktpa of cobalt (the "Accelerated Development Plan") through the earlier completion of the construction of Phases 3 and 4. The combination of the original Phases 3 and 4 is now referred to as the new Phase 3.

A Scoping and Engineering Study will commence in the first half of 2010 that will re-visit the process engineering with a view to reducing capital expenditure and simplifying process design, to ease the integration of existing process systems and infrastructure development required for the new Phases 4 and 5.

## 25.2.2. Ore Sources

Ore will principally be derived from the KOV Open Pit and Kamoto Underground Mine. Other minor sources of ore will include the T17 Open Pit in the near term and the Mashamba East Mine in later years, which will primarily provide oxide ores.

### 25.2.2.1 Ore Type and Mineralogy

The most important ore types that make up the bulk of the KML ore resources are sedimentary or stratiform copper-cobalt type. The copper-cobalt deposits comprise both oxide and sulphide ores.

The principal copper and cobalt sulphide minerals are chalcocite [Cu2S] and carrolite [(Co,Cu)2S4] respectively. Subordinate sulphide minerals of importance include bornite [Cu5FeS4], covellite [CuS] and chalcopyrite [CuFeS2], which is generally present in small quantities.

Supergene mineralisation is generally associated with the levels of subsurface oxidation, sometimes more than 100 m below surface, where the sulphide minerals have been altered to carbonates, silicates and phosphates. The most common secondary copper mineral is malachite [Cu2CO3(OH)2] with lesser minerals including cuprite [Cu2O], cornetite [Cu3(PO4)(OH)3], liberthenite [Cu2(OH)PO4] and pseudomalachite [Cu5(PO4)2(OH)4.H2O]. Small quantities of copper silicates such as chrysocolla [CuSiO3.nH2O] and copper carbonates such as azurite [Cu3(OH)2(CO3)2] also exist. Heterogenite [(Co,Cu,Mn,Fe)O(OH)] and kolwezite [(Cu,Co)2(CO3)(OH)2] are the principal secondary cobalt minerals, with some goethite[(Fe,Co)O(OH)].

The predominant gangue mineral is quartz [SiO2], but dolomite [Ca,Mg(CO3)2] is present in varying and very significant amounts. Other notable gangue components are mica [KMg3Si3AlO10(F,OH)2], clay [K-Al-Mg-Fe silicate hydroxides] and chlorite [(Mg,Fe)5Al(Si3Al)O10(OH)8].

### 25.2.2.2 KOV Open Pit

Historically, KOV Open Pit has been treated as an oxide deposit. However, the latest information suggests there is 30-50% sulphide in the remaining ore.

Typical primary copper sulphide minerals are bornite, chalcocite and minor chalcopyrite, while cobalt is in the form of carrolite. The mineralization occurs as disseminations or in association with hydrothermal carbonate alteration and silicification.

The most common secondary supergene minerals for copper and cobalt are malachite and heterogenite. Quartz, mica and dolomite are the predominant gangue minerals. KOV Open Pit ore is best treated by sulphide flotation followed by sulphuric acid leaching of flotation tails.

#### 25.2.2.3 Kamoto Underground Mine

Kamoto Underground Mine's mineralization is primarily sulphidic. Chalcocite and bornite are the major copper containing minerals occurring roughly in the ratio 1.5:1 predominantly as liberated grains. Trace amounts of covellite and chalcopyrite are also present.

Kamoto Underground Mine ore is amenable to sulphide flotation.

## 25.2.3. Metallurgy

The oxide and sulphide ores are typically treated by flotation to recover a higher grade concentrate that is then further treated in the refinery to recover a proportion of the copper and cobalt contained in the flotation concentrate. However, the oxide ores are very weathered and display poorer flotation response, which results in lower metal recoveries, generally lower copper and cobalt grades in concentrates and higher operating costs in comparison to sulphide ores. Acid consumption in leaching the oxide concentrate is also higher and a mix of oxide and sulphide concentrates is considered optimal feed.

A key distinction between the KOV Open Pit ore and the Kamoto Underground Mine ore is that, whilst the latter is almost entirely sulphidic, the former contains approximately 60% oxide ore underlain by sulphide ore.

## 25.2.4. Processing Facilities

#### 25.2.4.1 Kamoto Concentrator

The original Kamoto concentrator consists of Kamoto 1 and 2 sections built in 1968 and 1972 respectively and DIMA 1 and 2 sections built in 1981 and 1982 respectively.

Kamoto 1 treated mixed ore and oxides. The circuit comprised the following unit processes:

- autogenous milling operating in closed circuit with hydrocyclones;
- sulphide flotation including roughing, cleaning and middlings regrind to produce a sulphide concentrate;
- sulphidisation with NaHS; and
- oxide flotation including roughing and cleaning to produce an oxide concentrate.

Kamoto 2 primarily treated sulphide ore from Kamoto Mine. The circuit comprised the following unit processes:

- autogenous milling operating in closed circuit with hydrocyclones; and
- sulphide flotation including roughing, cleaning and middlings regrind.

The DIMA 1 circuit primarily treated oxides and mixed banded oxide / sulphide ore feeds. The circuit comprised the following unit processes:

- primary autogenous milling and secondary ball milling operating in closed circuit with hydrocyclones;
- sulphide flotation including roughing, cleaning, re-cleaning and middlings re-grind to produce a sulphide concentrate;
- sulphidisation with NaHS; and
- oxide flotation including roughing and cleaning to produce an oxide concentrate.

The DIMA 2 circuit treated oxide ore. The circuit comprised the following unit processes:

- primary autogenous milling and secondary ball milling operating in closed circuit with hydrocyclones;
- sulphidisation with NaHS; and
- oxide flotation including roughing and cleaning to produce an oxide concentrate.

### 25.2.4.2 Luilu Metallurgical Plant

Production at the Luilu Metallurgical Plant, located approximately 6 km north of the Kamoto Concentrator, commenced in 1960. The process route employed was roast-leach-electro-winning typical of other contemporary DRC and Zambian copperbelt operations. The circuit comprised the following unit processes:

- sulphide and oxide concentrate receipt, dewatering and storage;
- sulphide concentrate roasting;
- sulphuric acid copper leach of roaster calcine and oxide concentrate (oxidising leach assisted by air injection);
- secondary leach using high acid-consuming (dolomitic) concentrates;
- counter-current decantation and clarification;
- leach tailings filtration and residual sulphide flotation;
- tailings neutralisation and disposal;
- selenium removal via up-flow reactor containing copper granules;
- copper EW onto copper starter sheets (being converted to stainless steel blanks);
- de-copperising of cobalt bleed solution – two-stage EW;
- cobalt bleed solution purification including the following steps;
- iron removal by controlled pH precipitation using milk of lime;
- copper removal by two-stage controlled pH precipitation using milk of lime;
- nickel removal via precipitation with sodium hydrogen sulphide (NaHS) and cobalt chips under controlled pH;
- zinc removal by the addition of hydrogen sulphide (H2S) and neutralisation with sodium carbonate solution;
- controlled pH precipitation of cobalt with milk of lime;
- cobalt re-leaching with spent electrolyte and sulphuric acid under controlled pH;
- cobalt EW; and
- cobalt vacuum degassing and burnishing.

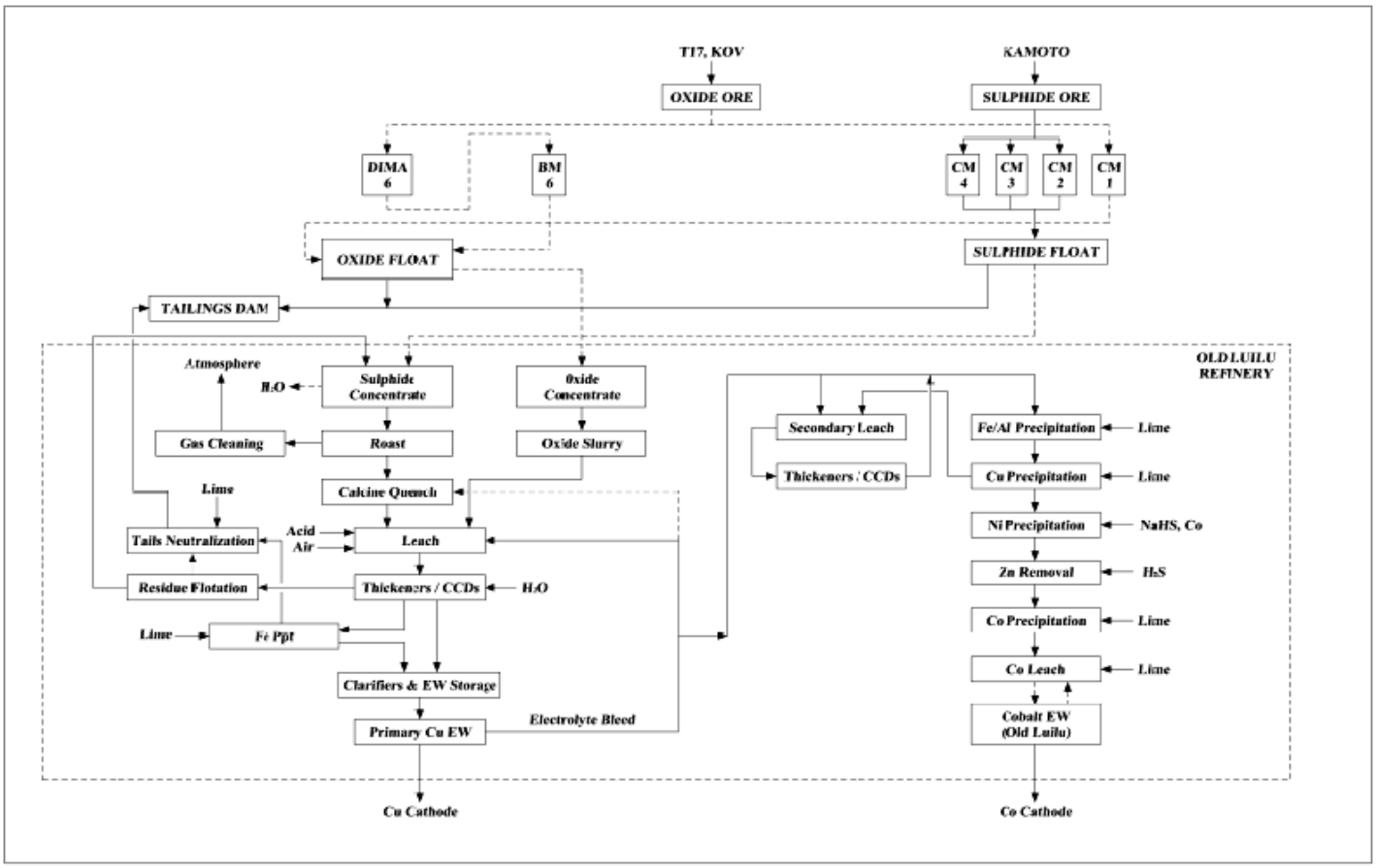
The Luilu Metallurgical Plant was designed to process sulphide and oxide concentrates with an initial capacity of 80 ktpa copper cathode. During the 1970s capacity was expanded to 175 ktpa copper cathode and 8 ktpa cobalt cathode. The grade of cathode copper produced in the first EW stage never met LME Grade 'A' quality, while most of the cathode and copper sponge produced in the secondary EW was not of commercial quality and was recycled to the Shituru smelter at Likasi. Cobalt recovery across the plant was only 45 to 60%, with the majority of the cobalt losses occurring at nickel and zinc sulphide precipitation with some also at iron removal and cobalt precipitation.

The condition of the plant in 2006, when taken over by KCC, was extremely poor and almost totally run down. A progressive renewal programme was planned, to match the increasing throughput. Considerable progress has been made to-date in the phased rehabilitation exercise. Completion of Phase 1 was December 2007 and completion of Phase 2 December 2009. The new roaster was commissioned in late 2009.

The new Phase 3 for which SNC-Lavalin South Africa are undertaking the engineering and procurement services, will essentially complete the rehabilitation of the Kamoto Concentrator and the Luilu Metallurgical Plant. A process simulation model has been developed, which indicates that the new Phase 3 of the Kamoto Concentrator and Luilu Metallurgical Plant can produce 150 ktpa of copper and 8 ktpa of cobalt. The new Phase 3 is planned to be

completed by the end of the second quarter of 2011. The block diagram for the new Phase 3 is presented in Figure 25.2.4.2.

**Figure 25.2.4.2: Metallurgical Processing: Block Diagram of New Phase 3**




Further production increases above the capacity of 150 ktpa copper and 8 ktpa cobalt will be assessed by a new Scoping and Engineering Study. This will confirm the phasing and capital expenditures related to the new Phases 4 and 5 after the completion of the Accelerated Development Plan.

### 25.2.4.3 Luilu Electro-Refinery

In a refurbishment programme initiated by UMHK in 1987 an electro-refining circuit consisting of a copper melting and anode casting facility and a 100 ktpa electro-refining cell house was constructed at Luilu. The melting and casting facility was apparently only operated for a few weeks before a runaway halted production and only one of the three sections of the cell house were ever operated. The apparently obvious option of converting the electro-refining cell house to an electro-winning cell house was considered but was shown not to be viable when compared to constructing a new 250 ktpa electro-winning plant. This will be re-evaluated as part of the Scoping and Engineering Study to be completed in 2010.

### 25.2.4.4 WOL/SX/EW Refinery Project

The proposed new circuit will be installed in phased "modules" and will ultimately comprise the following unit processes:

- primary crushing;
- milling in closed circuit with hydrocyclones;

- sulphide flotation comprising roughing, scavenging, cleaning and re-cleaning stages;
- pre-leach dewatering (thickeners);
- sulphuric acid copper leach of flotation tailings;
- sulphuric acid cobalt leach of flotation tailings (reducing leach assisted by addition of SO2);
- post-leach thickening and counter-current decantation;
- leach residue disposal;
- clarification of High-Grade and Low-Grade pregnant leach solutions;
- HG and LG copper solvent extraction ("SX");
- electrolyte filtration;
- copper EW;
- cobalt bleed solution purification including the following steps;
    - iron removal by controlled pH precipitation using milled limestone slurry;
    - manganese precipitation via contact with an air/ SO2 mixture;
    - aluminium and copper removal by two-stage controlled pH precipitation using milk of lime;
    - cobalt hydroxide precipitation with milk of magnesia slurry;
- cobalt hydroxide filtration, drying and packaging; and
- effluent treatment by precipitation with milk of lime at pH 10.3.

The new and old circuits will be linked by means of transferring the old leach residue and a spent electrolyte bleed to the new WOL section, with a corresponding volume bleed of SX raffinate back to the old leach. This will eliminate the need for the old secondary leach and secondary EW.

In the early years (up to 2014) tailings and leach residue will be pumped to an interim dam; then to the old Mupine Pit (in years 2015 to 2019). Thereafter they will be disposed of in a new, conventional, unlined tailings dam with the slurry being distributed around the perimeter by a system of moveable pipes. Surplus clear water will be allowed to overflow a penstock pipe into a return water dam ahead of recycle to the process. Surplus water, if any, will overflow to the Luilu River, after being appropriately treated. A sulphur-burning acid plant will be constructed to support the whole ore leach and a sulphur dioxide liquefaction plant will also be installed to provide concentrated SO2 gas to the following consumers:

- reductive leach; and
- Fe/Mn removal in the Cobalt section.

Crushed limestone (CaCO3) and burnt lime (CaO) will be sourced from the DRC supplier, the CCC Lime Plant at Likasi or from sources outside the DRC, which may include Turkey, and transported 200 km by rail to site. The crushed limestone will be milled to produce a finely ground limestone slurry. Burnt lime will be slaked in a slowly rotating ball mill to produce a fine milk of lime slurry.

The process design criteria assume that all reagents, including particularly lime, limestone, sulphur, magnesia, flocculants, SX extractant and SX diluent, will be available in the amounts and qualities specified in the design. In SRK's view, the supply of key reagents such as lime, magnesia and sulphur need to be further reviewed and confirmed contractually as soon as practical.

Utilities will include the generation of steam with electrode boilers, compressed air generation, production of demineralised water with reverse osmosis and a fire water system. Raw water for the plant will be sourced from the KOV Open Pit dewatering operation. Chlorinated potable water will be produced on site utilizing filtered raw water.

#### 25.2.4.5 Process Plant Capacity

The target copper capacity is 310 ktpa cathode copper, which will be produced in both the Luilu Metallurgical Plant and the proposed WOL/SX/EW refinery project. In November 2008, the capacity of the proposed WOL/SX/EW refinery project was reduced from its original design capacity of 250 ktpa cathode to 160 ktpa, with the balance of up to 150 ktpa to be produced in the refurbished Luilu Metallurgical Plant. It is important to note that only the proposed WOL/SX/EW refinery project will produce LME grade 'A' cathode.

The target cobalt capacity will be 30 ktpa cobalt. It was initially intended that all cobalt would be produced as cobalt hydroxide in the proposed WOL/SX/EW refinery project and that the old cobalt plant would be closed down. However, it is now intended to continue with the production of cobalt cathode in the refurbished Luilu Metallurgical Plant, increasing to the original nameplate capacity of 8 ktpa.

The Accelerated Development Plan has the following production targets for the new Phase 3:

- 110 ktpa Cu by 1st July 2010;
- 130 ktpa Cu by 1st January 2011; and
- 150 ktpa Cu by 1st July 2011.

New Phase 4 is targeted be completed in 2013 and new Phase 5 in 2015.

#### 25.2.4.6 Kolwezi Concentrator

In 2009, the Kolwezi Concentrator was released for the benefit of Gécamines as part of the discussions related to the Amended Joint Venture (see Section 6.2 – DCP Rights).

### 25.2.5 Copper and Cobalt Recovery

The recoveries of copper and cobalt used in the development of the economic model for the various process stages are set out in Table 25.2.5 below:

**Table 25.2.5: Long Term Copper and Cobalt Recoveries**

| Ore Type | Copper | Cobalt |
|---|---|---|
| Milling | 100% | 100% |
| Sulphide Float | 92% | 90% |
| Oxide Float | 82% | 58% |
| Roasting | 100% | 100% |
| Concentrate Leach | 89% | 50% |
| WOL | 92% | 85% |
| SX + EW | 100% | 100% |
| EW | 100% | 100% |

## 25.3. Marketing Study

KML has entered into off-take agreements with Glencore Financial (Bermuda) Ltd., pursuant to which Glencore Bermuda will buy 100% of the quantity of copper and cobalt produced by KCC and DCP for the LoM at market terms.

## 25.4. Contracts

All Contracts were within industry norms.

## 25.5. Environmental Considerations

A draft Environmental and Social Impact Assessment ("ESIA"), which incorporated an Environmental and Social Management Plan ("ESMP"), was prepared by SRK Consulting in April 2009. The draft ESIA was based on project development as reported in the 2009 Technical Report and as such would not have been consistent with the Accelerated Development Plan. As a result, SRK Consulting has amended the draft ESIA to include reference to operational activities and project development based on the Accelerated Development Plan only to ensure compliance with DRC laws.

The amended ESIA will be submitted for KCC review during the second quarter of 2010 following which the ESIA will be submitted for approval by DRC authorities.

## 25.6. Taxes and Key Business Operating Parameters

The operating parameters, which govern the royalty, tax, rehabilitation, DRC Capital Allowance and import duty rates applicable to the business, are described in Table 25.6:

**Table 25.6: Economic Analysis: Key Business Operating Parameters**

| Description | Explanation | Rate |
|---|---|---|
| DRC royalty (deduct from turnover) | % of revenue, less selling expenses | 2,0% |
| Gécamines royalty (deduct from turnover) | % of revenue, less selling expenses and debt redemption | 2,5% |
| DRC Corporate tax rate | | 30% |
| DRC Capital Allowance (year 1) | | 60% |
| DRC Capital Allowance (year 2 – 10) | | 12% to 1% |
| Import duties | Charged on certain imported items | 3% to 5% |

A royalty of 2% will be payable to the DRC, while a royalty of 2,5% will be payable to Gécamines. The DRC corporate tax rate of 30% has been applied. According to DRC legislation, taxation can be off-set against capital and deferred. All capital expenditure has a DRC Capital Allowance of 60% in the first year and a DRC Capital Allowance of 12% to 1% for each year thereafter. An import duty of 3% to 5% is applied to imported goods, if applicable.

In addition, USD 95,5 million has been budgeted and included in the cash flow model up to 2016 for payment to Gécamines for its Pas de porte payments.

## 25.7. Capital and Operating Cost Estimates

### 25.7.1. Capital Cost Estimate

The major capital cost items are described in Table 25.7.1.2 below. These include:

- **Kamoto Underground Mine:** capital expenditure includes provisions for purchase of the mining fleet required by the LoM plan, development costs to access new mining areas and for ventilation infrastructure.
- **KOV Open Pit:** capital expenditure includes stripping required to access the ore body that has been capitalised in 2010.
- **Mashamba East Mine:** capital expenditure includes provisions for purchase of the mining fleet required in the LoM plan.

- **Processing Capital Expenditure:** the capital expenditure includes provisions for the development of the process plant as described in Section 25.2 and summarized in Table 25.7.1.1 below. As noted elsewhere in this Technical Report, further study is recommended to improve the accuracy of the cost estimates, as these have been factorised from the 2008 Study and care should be exercised in their use.

**Table 25.7.1.1: Summary of Processing Plant Expenditure**

| | | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|
| | Unit | | | | | | |
| New Phase 3 | (USD m) | 167 | 72 | - | - | - | 239 |
| New Phases 4 and 5 | (USD m) | 22 | 88 | 381 | 191 | 107 | 789 |
| Total | (USD m) | 189 | 161 | 381 | 191 | 107 | 1 029 |

- **Effluent Ponds and Tailings:** this refers to the capital expenditure provisions for the development of the ponds and tailings facilities described in Section 20.5 of the 2009 Technical Report.
- **Environmentals:** this includes Far West Tailings Dam and ad hoc resettlement; artisanal mining, stakeholder engagement; jobs and economic opportunities; tarring of roads (to reduce dust and for risks associated with road safety); dust monitoring equipment; equipment for sulphur dioxide emission reductions/monitoring; surface water management (containment and management); general and hazardous waste (trenches and buildings); ad hoc equipment for ground water (equipment); water settlement facilities (for suspended solids); radiation monitoring and survey equipment; emergency response equipment and vehicles and equipment.
- **Dewatering**: this refers to the costs associated with the dewatering of the KOV Open Pit and Mashamba East Mine, which includes dewatering boreholes, borehole pumps, monitoring, design and control systems, software, geophysical surveys, water sampling and analysis, the regular updating of the dewatering model and the purchase and operation of equipment.
- **Power**: this refers to the capital expenditure for the provision of power described in Section 20.2.
- **General Infrastructure**: this refers to unallocated infrastructure spending of a general nature that is required to sustain mining operation in the DRC. This is in operating costs.

**Table 25.7.1.2: Investment Capital Costs (2010 – 2019)**

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unit | | | | | | | | | | |
| **Mining** | | | | | | | | | | | |
| Kamoto Underground Mine | (USD m) | 30 | 31 | 31 | 31 | 24 | 12 | 18 | 10 | 24 | 3 |
| KOV mobile mining fleet proceeds on sale | (USD m) | -40 | - | - | - | - | - | - | - | - | - |
| KOV pre-stripping, dewatering and other | (USD m) | 52 | 9 | 0 | 0 | 21 | 17 | 0 | 0 | 0 | 0 |
| Mashamba East Mine | (USD m) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 1 | 0 |
| Subtotal | (USD m) | 42 | 39 | 31 | 31 | 45 | 29 | 18 | 29 | 25 | 3 |
| **Processing** | | | | | | | | | | | |
| All phases and modules | (USD m) | 189 | 161 | 381 | 191 | 107 | - | - | - | - | - |
| **Other Cost Centres** | | | | | | | | | | | |
| Tailings | (USD m) | 5 | 5 | 5 | 5 | 0 | 13 | 13 | 13 | 13 | 13 |
| Environmental and social costs | (USD m) | 0 | 1 | 1 | 3 | 3 | 4 | 0 | 0 | 0 | 0 |
| Power | (USD m) | 13 | 23 | 42 | 61 | 21 | 9 | 6 | 6 | 6 | 6 |
| General capital expenditure | (USD m) | 32 | 39 | 41 | 40 | 40 | 40 | 41 | 25 | 25 | 25 |
| Subtotal | (USD m) | 50 | 67 | 89 | 109 | 64 | 66 | 60 | 44 | 44 | 44 |
| Total capital expenditure | (USD m) | 281 | 267 | 501 | 331 | 216 | 94 | 78 | 73 | 69 | 47 |

## 25.7.2. Operating Cost Estimates

The major operating cost items are described in Table 25.7.2 below. These include:

- **Open Pit and Underground Mining:** this includes the mining cash costs from:
  - **Kamoto Underground Mine**: the operating cost is based on current and budgeted costs as an owner operation. The weighted average cost applied over the LoM is USD 28/t ore mined.
  - **T17 Open Pit:** the cost is based on current mining contractor rates charged by Enterprise Generale Malta Forrest, a mining contractor, and is USD 7,65/bcm for mining and USD 2,82/t ore mined for haulage.
  - **KOV Open Pit**: the operating cost is based on a contractor performing the works. The initial cost is USD 6,22/bcm for mining and USD 2,27/t ore mined for haulage.
  - **Mashamba East Mine**: the operating cost is based on a contractor performing the works. The weighted average cost applied over the LoM is USD 3,55/t ore mined for haulage (estimate includes waste mining).
- **Kamoto Concentrator Costs**: this includes plant costs for reagents, consumables and power and is based on fixed costs of USD 6,4 million per annum and a variable cost of USD 2,90/t ore feed for the sulphide circuit and USD 9,10/t ore feed for the oxide circuit.
- **Luilu Metallurgical Plant**: this includes plant costs for reagents, consumables and power and is based on fixed costs of USD 14,2 million per annum and a variable cost of USD 0,24/lb for the Cu circuit and USD 2,38/lb for the Co circuit.
- **WOL/SX/EW Refinery Project**: USD 0,34/lb for the Cu circuit and USD 3,40/lb for the Co circuit.
- **General and Administrative Costs**: this refers to head office and other centralised costs.

- **Freight, Insurance and Sales Costs**: it is understood that all finished products (copper, cobalt) will be transported through Durban (the FOB point) either to Europe or to the Far East. Finished product CIF Rotterdam costs applied for Cu: USD 500/t and Co: USD 930/t.

**Table 25.7.2: Operating Costs (2010 – 2019)**

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Unit | | | | | | | | | | |
| **OPERATING COSTS** | | | | | | | | | | | |
| Open Pit and Underground Mining | (USD m) | -132 | -159 | -158 | -152 | -237 | -213 | -192 | -189 | -189 | -249 |
| Old Kamoto Concentrator and Luilu Metallurgical Plant | (USD m) | -93 | -126 | -134 | -128 | -126 | -141 | -140 | -143 | -140 | -166 |
| Kamoto Concentrator Costs | (USD m) | -30 | -32 | -45 | -40 | -38 | -26 | -30 | -34 | -28 | -34 |
| SX/EW Refinery | (USD m) | 0 | -1 | 0 | -80 | -130 | -174 | -164 | -167 | -163 | -173 |
| Tailings | (USD m) | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 | -1 |
| Total Operating Costs | (USD m) | -255 | -319 | -337 | -402 | -532 | -557 | -527 | -534 | -521 | -623 |
| General and Administrative Costs | (USD m) | -83 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 |

## 25.7.3. Copper and Cobalt Price Analysis

This Section outlines the price for copper and cobalt used in this Technical Report and is based on the latest available market information as of Friday, 19 February, 2010.

**Table 25.7.3: Commodity Price Assumptions**

| | Unit | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | LT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nominal Prices** | | | | | | | | | | | |
| Copper | $/t | 7 437 | 7 421 | 7 314 | 7 161 | 7 007 | 6 889 | 6 793 | 6 715 | 6 703 | 6 931 |
| Copper | $/lb | 3,37 | 3,37 | 3,32 | 3,25 | 3,18 | 3,12 | 3,08 | 3,05 | 3,04 | 3,14 |
| Cobalt | $/t | 44 092 | 39 683 | 35 274 | 33 069 | 33 069 | 33 069 | 28 913 | 28 913 | 28 913 | 29 171 |
| Cobalt | $/lb | 20,00 | 18,00 | 16,00 | 15,00 | 15,00 | 15,00 | 13,11 | 13,11 | 13,11 | 13,23 |
| **Real Term Prices** | | | | | | | | | | | |
| Copper | $/t | 7 424 | 7 321 | 7 061 | 6 591 | 6 292 | 6 035 | 5 805 | 5 598 | 5 452 | 5 500 |
| Copper | $/lb | 3,37 | 3,32 | 3,20 | 2,99 | 2,85 | 2,74 | 2,63 | 2,54 | 2,47 | 2,49 |
| Cobalt | $/t | 44 014 | 39 150 | 34 055 | 30 435 | 29 693 | 28 969 | 24 708 | 24 106 | 23 518 | 23 149 |
| Cobalt | $/lb | 19,96 | 17,76 | 15,45 | 13,81 | 13,47 | 13,14 | 11,21 | 10,93 | 10,67 | 10,50 |
| **Inflation Rates US Inflation Rates** | | 0,0005 | 0,01 | 0,015 | 0,025 | 0,025 | 0,025 | 0,025 | 0,025 | 0,025 | 0,025 |

The main input source for copper is the published LME monthly futures prices. The LME closing prices (evening evaluation), are derived from the final Kerb session of the LME trading of each day. These publicly available prices are quoted in nominal terms. The June contract serves as the basis for the respective year through to 2018. The long term price in nominal terms is derived backwards as our long terms prices are input in real terms.

The main input source for cobalt is the Metal Bulletin 99,8% Co US$/lb price available for the spot delivery in nominal terms. The forward curve is assumed to gradually decline for the next two years and to be stable at US$ 15/lb for three years, before the price falls to its long term price.

The conversion from real to nominal prices is based on United States inflation rates. The inflation rate is calculated from the Consumer Price Index (CPI-U) which is compiled by the Bureau of Labor Statistics and is based upon a 1982 Base of 100. We have assumed a 2,5%

inflation rate from 2013 and a gradual increase from 0,5% in 2010 to 2,5% in 2013. This conversion is based on the following formula:

$R_i = \frac{N_i}{(1 + inf_i)^{T_i}}$, whereas $R_i$ is the price in real terms in year i (2010 to LT), $N_i$ is the nominal price in year i, $inf_i$ is the inflation rate in year i and $T_i$ is the number of days from the reporting date to observation i divided by 365.

*[Remainder of this page intentionally left blank]*

## 25.8. Economic Analysis

This Section presents a discounted cash flow model described in Table 25.8.1 below; discount rate sensitivity described in Table 25.8.2; NPV and grade sensitivity described in Table 25.8.3; revenue and capital cost sensitivity described in Table 25.8.4; and revenue and operating costs sensitivity described in Table 25.8.5.

**Table 25.8.1: Discounted Cash Flow Model (2010 to 2022)**

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **January 2010 Money Terms Prices** | **Unit** | | | | | | | | | | | | | |
| Revenue | (USD m) | 811 | 1 139 | 1 198 | 1 463 | 1 747 | 2 167 | 2 121 | 2 057 | 2 000 | 2 025 | 2 032 | 2 193 | 2 164 |
| Less: Freight, Insurance and Sales Costs | (USD m) | -88 | -129 | -142 | -179 | -223 | -264 | -242 | -265 | -283 | -290 | -291 | -322 | -316 |
| **Net Revenue** | **(USD m)** | **723** | **1 010** | **1 056** | **1 284** | **1 523** | **1 903** | **1 879** | **1 792** | **1 717** | **1 735** | **1 741** | **1 872** | **1 848** |
| Operating Costs | (USD m) | -255 | -319 | -337 | -402 | -532 | -557 | -527 | -534 | -521 | -623 | -615 | -703 | -708 |
| Other Costs | (USD m) | -83 | -117 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 |
| Net change in working capital | (USD m) | -62 | 5 | -18 | -58 | -19 | -24 | 5 | 5 | 5 | -18 | -1 | -20 | 2 |
| **Total Expenses** | **(USD m)** | **-400** | **-432** | **-438** | **-542** | **-634** | **-662** | **-604** | **-611** | **-598** | **-723** | **-697** | **-805** | **-788** |
| Taxation | (USD m) | -1 | -1 | -1 | -1 | -34 | -343 | -427 | -358 | -302 | -292 | -268 | -296 | -314 |
| Capital Expenditure | (USD m) | -281 | -267 | -501 | -331 | -216 | -94 | -78 | -73 | -69 | -47 | -62 | -56 | -53 |
| Gécamines Royalties | (USD m) | 0 | -6 | -3 | -7 | -30 | -12 | 0 | -108 | -186 | -169 | -175 | -175 | -174 |
| **Net Free Cash** | **(USD m)** | **41** | **304** | **114** | **403** | **611** | **791** | **770** | **641** | **563** | **505** | **539** | **540** | **519** |

**Table 25.8.1 (cont'd): Discounted Cash Flow Model (2023 to 2035)**

| | | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **January 2010 Money Terms Prices** | **Unit** | | | | | | | | | | | | | |
| Revenue | (USD m) | 2 119 | 2 155 | 2 134 | 2 029 | 1 834 | 1 774 | 1 263 | 1 260 | 1 263 | 1 243 | 1 227 | 71 | 71 |
| Less: Freight, Insurance and Sales Costs | (USD m) | -308 | -316 | -311 | -290 | -259 | -247 | -175 | -175 | -172 | -169 | -166 | -3 | -3 |
| **Net Revenue** | **(USD m)** | **1 811** | **1 839** | **1 823** | **1 739** | **1 576** | **1 526** | **1 088** | **1 085** | **1 091** | **1 075** | **1 061** | **67** | **67** |
| Operating Costs | (USD m) | -688 | -733 | -743 | -694 | -550 | -527 | -424 | -385 | -317 | -310 | -301 | -33 | -33 |
| Other Costs | (USD m) | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -82 | -172 | -222 |
| Net change in working capital | (USD m) | 9 | -8 | -6 | 19 | 32 | 9 | 60 | 10 | 5 | 2 | 4 | 121 | 0 |
| **Total Expenses** | **(USD m)** | **-762** | **-823** | **-831** | **-757** | **-600** | **-600** | **-446** | **-457** | **-395** | **-390** | **-379** | **-84** | **-256** |
| Taxation | (USD m) | -292 | -294 | -292 | -284 | -272 | -269 | -258 | -133 | -186 | -218 | -195 | -194 | 0 |
| Capital Expenditure | (USD m) | -44 | -37 | -25 | -25 | -32 | -34 | -28 | -27 | -25 | -25 | -25 | -25 | -25 |
| Gécamines Royalties | (USD m) | -177 | -171 | -168 | -165 | -169 | -158 | -103 | -93 | -121 | -112 | -114 | -31 | 0 |
| **Net Free Cash** | **(USD m)** | **536** | **515** | **507** | **507** | **502** | **466** | **253** | **375** | **365** | **331** | **348** | **-267** | **-213** |

**Table 25.8.2: Discount Rate Sensitivity – Discounting per Quarter**

| Discount Factor | NPV |
|---|---|
| (%) | (USD m) |
| 8% | 4 771 |
| 10% | 4 045 |
| 12% | 3 467 |
| 14% | 3 002 |
| 16% | 2 623 |
| 18% | 2 310 |
| 20% | 2 050 |

**Table 25.8.3: NPV and Grade Sensitivity**

| Sensitised Factor | Sensitivity Range (@14% discount rate) | | | | | | |
|---|---|---|---|---|---|---|---|
| | -15% | -10% | -5% | 0% | 10% | 20% | 30% |
| Grade (Cu%) | 3,90% | 4,13% | 4,36% | 4,59%* | 5,05% | 5,51% | 5,97% |
| Grade (Co%) | 0,38% | 0,40% | 0,42% | 0,45%* | 0,49% | 0,53% | 0,58% |
| NPV USD(m) | 2 586 | 2 767 | 2 896 | 3 002 | 3 099 | 3 207 | 3 277 |

*Average grade

**Table 25.8.4: Revenue and Capital Cost Sensitivity**

| | | Revenue Sensitivity Range (@14% discount rate) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NPV | | | | | | | | |
| (USD m) | | -30% | -20% | -10% | 0% | 10% | 20% | 30% |
| | -15% | 1 341 | 1 989 | 2 626 | 3 242 | 3 835 | 4 444 | 5 007 |
| Total | -10% | 1 249 | 1 891 | 2 536 | 3 163 | 3 762 | 4 352 | 4 940 |
| Capital | -5% | 1 142 | 1 816 | 2 447 | 3 068 | 3 693 | 4 276 | 4 865 |
| Costs | 0% | 1 032 | 1 733 | 2 360 | 3 002 | 3 599 | 4 200 | 4 803 |
| Sensitivity | 10% | 921 | 1 636 | 2 299 | 2 904 | 3 525 | 4 131 | 4 711 |
| Range | 20% | 809 | 1 545 | 2 196 | 2 816 | 3 446 | 4 065 | 4 638 |
| | 30% | 699 | 1 472 | 2 125 | 2 742 | 3 350 | 3 972 | 4 564 |

**Table 25.8.5: Revenue and Operating Cost Sensitivity**

| | | Revenue Sensitivity Range (@14% discount rate) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NPV** | | | | | | | | |
| (USD m) | | -30% | -20% | -10% | 0% | 10% | 20% | 30% |
| | -15% | 1 433 | 2 090 | 2 709 | 3 342 | 3 936 | 4 522 | 5 105 |
| Total | -10% | 1 325 | 1 973 | 2 592 | 3 218 | 3 841 | 4 421 | 5 007 |
| Operating | -5% | 1 182 | 1 846 | 2 475 | 3 106 | 3 720 | 4 303 | 4 890 |
| Costs | 0% | 1 032 | 1 733 | 2 360 | 3 002 | 3 599 | 4 200 | 4 803 |
| Sensitivity | 10% | 726 | 1 482 | 2 137 | 2 750 | 3 375 | 3 983 | 4 568 |
| Range | 20% | 418 | 1 246 | 1 911 | 2 517 | 3 146 | 3 767 | 4 349 |
| | 30% | 104 | 949 | 1 661 | 2 302 | 2 928 | 3 546 | 4 151 |

## 25.9. Payback

The payback for the initial five years of USD 1,1 billion capital invested in new Phases 3, 4 and 5, is approximately 4,5 years. The payback for the invested capital at an interest rate of 7,60% (the sum of the United States Federal Reserve five-year interest rate swap of 2,60% and a 5% risk premium) is approximately five years.

## 25.10. Mine Life

Based on the assumptions as at 31 December 2009, KML has Proven and Probable Mineral Reserves of 137,6 Mt of ore with a grade of 4,51% Cu and 0,43% Co, which support the LoM plans described in Section 25.1.

# GLOSSARY OF TERMS, ABBREVIATIONS, UNITS AND CHEMICAL ELEMENTS

No change from 2009 Technical Report.

## Glossary of Terms

| | |
|---|---|
| 2009 Technical Report | SRK Consulting (South Africa) (Proprietary) Limited Technical Report dated 17 March 2009 |
| Accelerated Development Plan | KML's announced intention to accelerate ramp up of production to 150 ktpa of copper and 8 ktpa of cobalt |
| Argillaceous | Term describing sedimentary rocks with a modal grain size in the silt fraction |
| Assay | The chemical analysis of mineral samples to determine the metal content |
| Assaying | The chemical analysis of mineral samples to determine the metal content |
| Basal conglomerate | A conglomerate formed at the earliest portion of a stratigraphical unit |
| Bateman or Bateman Engineering | Bateman Projects Limited |
| Capital expenditure | All other expenditures not classified as operating costs |
| Concentrate | A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore. |
| Crushing | Initial process of reducing ore particle size to render it more amenable for further processing |
| Dip | Angle of inclination of a geological feature/rock from the horizontal |
| Dolomite | The name of a sedimentary carbonate rock and a mineral, both composed of calcium magnesium carbonate |
| Drill-hole | Method of sampling rock that has not been exposed |
| D Strat (Stratified Dolomite or Dolomie Stratfie) | This is a well bedded to laminated, argillaceous dolomite, which forms the base of the traditional "Lower Ore Zone" in Gécamines' nomenclature |
| Effective Date | Effective date of the Technical Report |
| Fault | The surface of a fracture along which movement has occurred |
| Filtration | Process of separating solid material from a liquid |
| Flotation | Process by which the surface chemistry of the desired mineral particles is chemically modified such that they preferentially attach themselves to bubbles and float to the pulp surface in specially designed machines. The gangue or waste minerals are chemically depressed and do not float, thus allowing the valuable minerals to be concentrated and separated from the undesired material |

| | |
|---|---|
| Geochronological | The measurement of time intervals on a geological scale |
| Grade | The measure of concentration of copper or cobalt within mineralized rock |
| Hanging wall | The overlying side of an ore body or slope |
| Haulage | A horizontal underground excavation which is used to transport mined ore or the transport of mined ore from an open pit to a treatment plant |
| Hydrogeology | A science that deals with sub-surface water and with related geologic aspects of surface water |
| Indicated Mineral Resource | The part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed |
| Intrusives | A body of igneous rock which has forced itself onto pre-existing rocks, either along some definite structural feature or by defamation or cross-cutting of the invaded rocks |
| Kamoto Concentrator | Kamoto, an operating concentrator |
| Kamoto Underground Mine | Kamoto, an operating underground mine |
| Kananga Mine | Kananga, a dormant open pit mine |
| KML Mines | Kamoto/Mashamba East Mine, the KOV Open Pit, the Kamoto Underground Mine, and two oxide open pit resources properties in the Kolwezi District of the DRC |
| Kolwezi Concentrator | Kolwezi, an operating concentrator |
| KOV Open Pit | KOV open pit mine, a development project |
| Lithology or lithogical | Geological description pertaining to different rock types |
| LoM plans | Life-of-mine plans |
| Luilu Metallurgical Plant | Luilu, an operating metallurgical plant |
| Mashamba East Mine | Mashamba East mine, a development project |
| Material Assets | Collectively, Kamoto Underground Mine, T17 Open Pit, KOV Open Pit, Mashamba East Mine, Tilwezembe Open Pit, Kananga Mine, Kamoto Concentrator, Luilu Metallurgical Plant, and infrastructure necessary for the production of the saleable metals |

| | |
|---|---|
| Measured Mineral Resource | The part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity |
| Metasedimetory | Metamorphosed sedimentary rock |
| Mica | Layer-lattice minerals of the three-layer type, and may be divided into the dioctahedral muscovite group and the trioctahedral phlogopite-biotite group |
| Milling | A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product. |
| Mineral Reserve | The economically mineable material derived from a measured and/or indicated mineral resource. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified. Mineral reserves are sub-divided in order of increasing confidence into probable mineral reserves and Proved Mineral Reserve |
| Mineral Resource | A concentration or occurrence of material of economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable and realistic prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a mineral resource are known, estimated from specific geological evidence and knowledge, or interpreted from a well constrained and portrayed geological model. Mineral resources are sub-divided in order of increasing confidence, in respect of geoscientific evidence, into inferred, indicated and measured categories |
| Mining Code | DRC Law No. 007/2002 of 11 July 2002 |
| Mwashya or R4 | Altered stratified greyish siliceous dolomitic rock with oolitic horizons and a few bands of light yellow talcose schist |
| Orogeny | An orogeny is a period of mountain building leading to the intensely deformed belts which constitute mountain ranges |

| | |
|---|---|
| Probable Mineral Reserve | The economically mineable material derived from a measured and/or indicated mineral resource. It is estimated with a lower level of confidence than a Proved Mineral Reserve. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, and including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified. |
| Proterozoic | Era of geological time between $2{,}5x10^{9}$ and $570x10^{6}$ years ago |
| Proved Mineral Reserve | The economically mineable material derived from a Measured Mineral Resource. It is estimated with a high level of confidence. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, including consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified |
| Qualified Person | Has the meaning given by NI 43-101 |
| Roches Argilleuses Talceuse (RAT) | The RAT is considered the boundary between the R2 and R1 units and consists of an upper RAT Grises (R2) and a lower RAT Lilas (R1) |
| Roches Siliceuses Feuilletées Foliated (Laminated) and Silicified Rocks (RSF) | This is a grey to light brown thinly bedded laminated and highly silicified dolomites |
| Roches Silicieuses Cellulaires or Siliceous Rocks with Cavities (RSC) | Vuggy and infilled massive to stromatolitic silicified dolomites |
| SAMREC code | South African code for reporting of Mineral Resources and Mineral Reserves |
| Schist/s | A regionally metamorphasised rock characterised by a parallel arrangement of the bulk of the constituent minerals |
| Schistes De Base or Basal Schists (SDB) | Reddish-brown to grey silty and nodular dolomite to siltstone |
| Sedimentary | Rocks formed by the accumulation of sediments, formed by the erosion of other rocks |
| Shales Dolomitiques Superieurs or Upper Dolomitic Shales (SDS) | Yellowish, cream to red bedded laminated dolomitic siltstones and fine-grained sandstones. |
| Stratigraphy | Study of stratified rocks in terms of time and space |

| | |
|---|---|
| Sulphide | Sulphur bearing mineral |
| T17 Open Pit | T17, an operating open pit mine |
| Tailings | Finely ground waste rock from which valuable minerals or metals have been extracted |
| Technical Report | This technical report prepared by Katanga Mining Limited, entitled "A Technical Report on the Material Assets of Katanga Mining Limited, Katanga Province, DRC" dated 31 March 2010 |
| Tilwezembe Open Pit | Tilwezembe, a recently closed open pit mine |
| Volcanics | One of three groups into which rocks have been divided. The volcanic assemblage includes all extrusive rocks and associated intrusive ones |
| Volcanoclastics | One of the three groups into which rocks have been divided. The volcanic assemblage includes all extrusive rocks and associated intrusive ones |
| WOL/SX/EW Refinery Project | Whole ore leach, solvent extraction and electro-winning Refinery project |

## Abbreviations

| | |
|---|---|
| 3D | Three dimensional |
| AAS | Atomic Absorption Spectroscopy |
| AGES | Africa Geo-Environmental Services |
| ASCu | Acid Soluble Copper |
| CAMI | Cadastre Minier de la Republique Démocratique due Congo |
| DCP | DRC Copper and Cobalt Project SARL |
| DIMA | The Dikuluwe-Mashamba |
| DRC | Democratic Republic of Congo |
| ESIA | Environmental and Social Impact Assessment |
| ESMP | Environmental and Social Management Plan |
| EW | Electro-winning |
| FOB | Free On Board |
| GEC | Global Enterprises Corporate Ltd. |
| GECL | Global Enterprises Corporate Limited |
| HG | High Grade |
| HSSE | Health Safety Social and Environment |
| HV | High voltage |
| IRR | Internal Rate of Return |
| JKTech | JKTech (Pty) Ltd |
| KCC | Kamoto Copper Company SARL |
| KFL | KFL Limited |

| | |
|---|---|
| KML | Katanga Mining Limited |
| KOV | Kamoto Oliviera and Virgule |
| LG | Low Grade |
| LME | London Metal Exchange |
| LoM | Life-of-Mine |
| NPV | Net Present Value |
| PE | permis d'exploitation |
| QA/QC | Quality Assurance and Quality Control |
| QC | Quality control |
| SAG | Semi-Autogenous Grinding |
| SAMREC | South African Minerals and Resources Committee |
| SCK | Station de Conversion de Kolwezi |
| SG | specific gravity |
| SI | International System of Units |
| SNCC | Société Nationale des Chemins de Fer du Congo |
| SNEL | Société National d'Electicité |
| SRK | SRK Consulting (South Africa) (Proprietary) Limited |
| SX/EW | Solvent Extraction/Electro-winning |
| TAP | Trans-Africa Projects |
| UG | underground |
| UMHK | Union Miniere du Haut Katanga |
| USD | United States Dollar |

**Units**

| | |
|---|---|
| % | percentage |
| %ASCu | percentage Acid Soluble copper |
| %CaO | percentage calcium oxide |
| %Cu | percentage copper |
| %CuO | percentage copper as oxide |
| %TCo | percentage total cobalt |
| %TCu | percentage total copper |
| ± | plus or minus |
| bcm | bank cubic metre |
| bn | billion |
| c/lb | cents per pound |
| dBA | decibels |
| GPa | Giga Pascal |

| | |
|---|---|
| ha | hectare |
| ha/yr | hectare per year |
| kg | Kilogram |
| kg/t | kilogram per tonne |
| km | kilometre |
| km/h | kilometres per hour |
| $km^2$ | square kilometres |
| kPa | kilo Pascal |
| kt | kilo tonne |
| ktpa | kilo tonnes per annum |
| ktpm | kilo tonnes per month |
| kV | kilo Volt |
| kV AC | kilo Volt Alternating Current |
| kWh | Kilowatt-hour |
| l | litre |
| l/hr | litres per hour |
| l/sec | litres per second |
| lb | pound |
| m | metre |
| m/d | metres per day |
| m/s | metre per second |
| $m^2$ | square metre |
| $m^2$/day | square metre per day |
| $m^3$ | cubic metres |
| $m^3$/d | cubic metres per day |
| $m^3$/ha/d | cubic metre per hectare per day |
| $m^3$/hr | cubic metres per hour |
| $m^3$/s | cubic metres per second |
| mamsl | metres above mean sea level |
| mbgl | metres below ground level |
| mg/l | milligram per litre |
| mm | millimetre |
| mm/year | millimetre per year |
| $Mm^3$ | Million cubic metres |
| MPa | Mega Pascal |
| Mt | Million tonnes |
| Mt | Million tonnes |

| | |
|---|---|
| Mtpa | Million tonnes per annum |
| MVA | Mega Volt Ampere |
| MW | Mega Watt |
| MWh | Mega Watt hour |
| ° | Degrees |
| pH | Measure of the acidity or alkalinity of a solution |
| sec | second |
| sq. km | square kilometres |
| T | tonne (1000 kg) |
| $t/m^3$ | tonnes per cubic metre |
| tpa | tonnes per annum |
| tpd | tonnes per day |
| tph | tonnes per hour |
| tphr | tonnes per hour |
| tpvm | tonnes per vertical metre |
| USD/bcm | United States Dollars per bank cubic metre |
| USD/h | United States Dollars per hour |
| USD/t | United States Dollars per tonne |
| USD/t/km | United States Dollars per tonne per kilometre |
| USDm | United States Dollar million |
| vmpa | vertical metre per annum |

**Chemical Elements**

| | |
|---|---|
| $(Co,Cu)_2S_4$ | carrolite |
| (Co,Cu,Mn,Fe)O(OH) | heterogenite |
| $(Cu,Co)_2(CO_3)(OH)_2$ | kolwezite |
| (Fe,Co)O(OH) | goethite |
| $(Mg,Fe)_5Al(Si_3Al)O_{10}(OH)_8$ | chlorite |
| As | arsenic |
| $Ca,Mg(CO_3)_2$ | dolomite |
| $CaCO_3$ | limestone |
| CuO | copper oxide |
| CaO | lime |
| Co | cobalt |
| $Co(OH)_2$ | cobalt hydroxide |
| Cr | chrome |
| Cu | copper |
| $Cu_2(OH)PO_4$ | liberthenite |

| | |
|---|---|
| $Cu_2CO_3(OH)_2$ | malachite |
| $Cu_2O$ | cuprite |
| $Cu_2S$ | chalcocite |
| $Cu_3(PO_4)(OH)_3$ | cornetite |
| $Cu_5(PO_4)_2(OH)_4.H_2O$ | pseudomalachite |
| $Cu_5FeS_4$ | bornite |
| CuS | covellite |
| Fe | iron |
| $H_2S$ | hydrogen sulphide |
| $H_2SO_4$ | sulphuric acid |
| K-Al-Mg-Fe silicate hydroxides | clay |
| $KMg_3Si_3AlO_{10}(F,OH)_2$ | mica |
| MgO | magnesium oxide |
| Mn | manganese |
| NaHS | sodium hydrogen sulphide |
| Ni | nickel |
| $NO_2$ | nitrogen dioxide |
| Pb | lead |
| Se | selenium |
| $SiO_2$ | Silica / quartz |
| $SO_2$ | sulphur dioxide |