MINERAL RESERVES AND MINERAL RESOURCES
Year ended 31 December 2019

Mineral Reserves and Mineral Resources estimation methods

The annual review of Mineral Resources and Mineral Reserves is mainly focused on mine reserve reports, depletion through production, analysis of company plans, new exploration results, new technical reports and other changes affecting the Mineral Resources and Mineral Reserves.

Kazakhstan inherited the classification system and estimation methods for minerals that were established in the Former Soviet Union (FSU). Updated "Regulations for the Classification of Non-ferrous Metals Reserves" became law in Kazakhstan in 2006. In practice, this means that the statements of resources and reserves developed by KAZ Minerals (and the mining plans to which they relate) must be submitted for approval to the corresponding committees of the Ministry for Investment and Development, for which adherence to the standardised national system of resource and reserve estimation is mandatory.

Mineral deposits are classified according to their degree of geological complexity into one of three deposit categories (for copper deposits), which determine the density of exploration sampling and the proportions and classifications of the State Commission on Mineral Reserves (GKZ) reserves that must be estimated. As part of the exploitation licence for each mineral deposit, a set of "Conditions for Estimation of Reserves" are prepared by a Kazakhstan licenced design institute and submitted for approval to the State. The Conditions for each deposit specify the minimum thickness for exploitation of the orebody and cut-off grades, plus special considerations which may apply where the conditions for mineral extraction are exceptional or present difficulties.

For the operating mines in the East Region and Kyrgyzstan, a review has been made of the reserves statements of KAZ Minerals and they are presented in accordance with the criteria to meet KAZRC standards. Guidelines on the "Alignment of Kazakh minerals reporting standards and the CRIRSCO Template" were published during 2015 as a joint initiative of the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) and the Kazakh Committee of Geology and Subsoil Use and State Reserves Committee. The guidelines have been used to align categories of reserves (B, C1 and C2) with appropriate, internationally recognised, Mineral Resource categories (Measured, Indicated and Inferred). The Competent Person, however, remains responsible for any estimate that is reported.

Mineral Resources, by definition, must have reasonable prospects for eventual economic extraction. In general, therefore, the total active balance reserve, where no unresolvable problems are foreseen, is considered as the Mineral Resource. Balanced reserves in categories B and C1 are assigned to Measured Mineral Resource and C2 category is assigned to Indicated Mineral Resource. Mineral Reserves in Proved and Probable categories are then converted from the Resources, after consideration of mining plans and after the application of appropriate modifying factors for loss and dilution. Legal approval for the exploitation of a particular reserve block is also taken into consideration.

For the Company's new mining operations at Aktogay and Bozshakol, and the development projects at Koksay and Baimskaya, the assessment of Mineral Resources and Mineral Reserves is based on computer modelling and estimated in accordance with the guidelines of KAZRC/JORC. Each of these projects is being developed following international best practice, which includes the creation of a computerised geological model linked to an electronic database. GKZ estimates of tonnage and metal content will continue to be undertaken to comply with national Kazakhstan requirements.

The Koksay deposit and the Peschanka deposit in the Baimskaya licence area have Mineral Resources based on estimates undertaken by third part consultants. The Competent Persons for these projects are employees of the respective consulting companies and their consent for the disclosure of the estimates for which they are responsible is shown at the end of the report.

Stockpiling of mined ore is common practice at large open pit mines, usually as a means of providing a consistent tonnage and grade feed to the processing plant. Stockpiled ore is included in the inventory of Mineral Reserves and Mineral Resources, but reference is made to the quantity of material held in stockpile at year end. In the case of mined ore added to a heap leach pad, this is considered as "in process" and hence is not included in the Mineral Reserve and Mineral Resource Statement.

The assessment of Inferred Resources for KAZ Minerals is incomplete. The mines do not keep records of 'prognosticated reserves' (as defined in Kazakhstan), categories P1, P2 and P3 under GKZ, which may include material that could be considered equivalent to the KAZRC category of Inferred Resources. Inferred Resources are shown in the tabulations for Aktogay, Bozshakol, Koksay and Peschanka where model-based estimates have been used and Inferred Resources have been categorised as such by a Competent Person under the KAZRC/JORC.

All Mineral Reserves quoted in the following tables are discounted for ore losses and dilution and refer to estimates of tonnes and contained metal grades at the point of delivery to the processing plant. Tonnage figures refer to dry metric tonnes.

Mineral Resources are reported inclusive of Mineral Reserves, but not discounted for loss and dilution.

Read more on pages 186 to 189 of KAZ Minerals Annual Report and Accounts 2019.