

## MODELLING OF MULTI-COMPONENT SALT SOLUTION MINING

by

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### SUMMARY

Billiton International Metals, a member of the Royal Dutch Shell Group of companies, is applying the solution mining technique to recover magnesium-chloride-containing brines from carnallitic deposits in the northern part of the Netherlands. These brines will be further processed to magnesium oxide.

As part of this project Billiton is sponsoring a research programme at the Koninklijke/Shell-Laboratorium, Amsterdam (KSLA). An extensive study has been made of the dissolution behaviour of multicomponent salts. On the basis of this investigation a theoretical model has been developed which describes the down-hole leaching process in ores containing carnallite ( $\text{MgCl}_2 \cdot \text{KCl} \cdot 6\text{H}_2\text{O}$ ), halite ( $\text{NaCl}$ ), bischofite ( $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ ) and kieserite ( $\text{MgSO}_4 \cdot \text{H}_2\text{O}$ ). The model has been checked against field data from an actual cavity; the calculated data show very good agreement with the measured results.