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Development of the Falea polymetallic uranium project

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The Falea uranium, silver, copper deposit is located in south western Mali, West Africa and is owned by Denison Mines Corp. The current resource estimate is approximately 45 million pounds of uranium (U3O8) at an average grade of ˜ 0.07% U3O8. The deposit also contains ˜ 37 million Oz Ag and ˜70,000 t Cu. The dominant uranium mineral is uraninite, copper is present mainly as chalcopyrite and silver mainly as argentite, and in its native form. Only 5% of the property has been explored to date, and all zones remain open. This paper reports the results of several stages of metallurgical investigations to support ongoing economic studies for the project.

The polymetallic nature of the Falea deposit dictates that there are a range of flowsheet options. The ore contains both carbonate and sulphide mineralisations, which have potential impacts on acid and alkaline leaching, respectively. There is also the need to recover both silver and copper. Two primary flowsheet options were considered:

1) Acid leach of ore to recover uranium / flotation of leach residue to recover sulphide concentrate, treatment of concentrate for Cu and Ag recovery;

2) Flotation of ore / alkaline leaching of flotation tails to recover uranium and treatment of flotation concentrate for Cu and Ag recovery.

A number of sub-options were considered for each flowsheet. Test work showed that high recoveries of copper and silver to flotation concentrate were obtained for both flotation of ore or acid leach residue. Uranium extraction was also > 90% for both acid and alkaline leaching. The preferred flowsheet was selected after trade-off studies by DRA.

This paper presents an overview of the various flowsheet options considered, an outline of the preferred flowsheet, and the results and conclusions of on-going engineering and laboratory/pilot studies to refine the preferred flowsheet.

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