Geology, resource estimation & characterisation of the Stuart oil shale deposit: When are there enough data?

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Since discovery in 1977, the Tertiary lacustrine Stuart Oil Shale Deposit in Central Queensland Australia has undergone detailed geological, geophysical, mineralogical, geotechnical and geochemical characterisation and assessment of both the oil shale and waste materials to support the greenfields shale-to-liquids project located at the Stuart New Fuels Development Centre. The project has a total resource of 2.6 billion barrels of shale oil based on data from more than 18,000 core samples from more than 40 kilometres of drilling in 380 drillholes. The resource base makes Stuart a very large project with a long-term mine-life and potential long-term benefits. In large mining and processing projects it is vital to demonstrate complete understanding of the deposit characteristics not only for both process and mine planning but also for public/government assessment and social requirements to demonstrate an open due diligence process with respect to the project. This paper will present an overview of the geology and resource estimation for the deposit and outline the important role of both geophysical and geochemical characterisation techniques used in support of the geological model and estimate. In addition, a brief outcome of the detailed assessment program undertaken over several years to characterise and assess mineral waste and ore will be described. The test work undertaken has been very detailed and has generated a large and complex dataset, more than 80,000 analytical results and highlights the importance to be placed on understanding the baseline mineral waste characteristics.