

**APPRAISAL AND DEVELOPMENT
OF THE CHOOKOO FIELD, ATP 259P**

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This paper describes the approach taken by Delhi and its joint venture partners (SANTOS, Vamgas, Ampol, Claremont and OCA) in the appraisal and development of the Chookoo field.

The Chookoo field is located in the Naccowlah block in southwest Queensland, approximately 1000 km west of Brisbane. Hydrocarbons were discovered in the Hutton Sandstone in 1983 by the Chookoo 1 well. The accumulation consists of a thin oil column, overlain by a large gas cap and underlain by an active aquifer. The presence of moveable oil, gas and water in the reservoir complicates the prediction of the reservoir behaviour in comparison to other Hutton Sandstone fields in the area which contain predominantly dead crudes. This demanded that reservoir parameters be carefully studied before the instigation of a full development programme.

The Chookoo structure is a WNW-ESE trending elongated anticline. The trapping mechanism of hydrocarbons is stratigraphically and structurally controlled. Sandstone pinchouts and shale-filled channels act as permeability barriers to hydrocarbon movement. The Hutton Sandstone reservoir is generally of high quality with porosities averaging 18% and permeabilities ranging from 10 to 3000 md.

The thin oil column presents a difficult production target with both gas and water coning being anticipated early in the field life. An early development scenario proposed a gas cycling scheme with peripheral wells located outside the mapped gas-oil contact. Inadequate areal definition of the field contacts, vertical permeability distribution, and lack of production performance data precluded early initiation of a full field development.

A number of tests have been performed to define the production characteristics, rock properties and fluid properties of the reservoir. The data collected has revealed the complexity of the reservoir. Of particular concern were the results indicating that the reservoir thickness and productivity decrease towards the edges, and that the reservoir sands are possibly discontinuous. A pilot gas cycling scheme was implemented in November 1985 to provide additional reservoir performance data.

The Chookoo Hutton Sandstone reservoir appraisal reinforces the importance of obtaining geological and engineering data early in the field life and the need to avoid making broad assumptions about reservoir behaviour from limited data.