ESTIMATING FUTURE PETROLEUM PRODUCTION FROM UNDISCOVERED FIELDS

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The Bureau of Mineral Resources is developing methods for estimating future production from undiscovered fields by simulating the exploration, discovery, and production process in a complex computer model. Development of the model requires an understanding of the distribution of our undiscovered petroleum, the future level of drilling, success rates, the likely sizes of new discoveries, their order of discovery, the lead times from discovery to production, and the rate of petroleum production.

The amounts of oil or gas likely to be discovered by a specified number of wells can be predicted by projecting historical trends such as the average amount of petroleum discovered per well drilled and the average area of the prospects drilled. Historical data can also be used to estimate likely future success rates and factors of economic importance, such as water depth, which help to determine the lead time between discovery and production.

The most difficult problem is to devise an acceptable level and pattern of drilling throughout Australia for the period of the estimate. Studies show that discovery rate has an important influence on the level and distribution of the drilling activity, but other factors are also responsible and there is no reliable method of determining the level of drilling 5–10 years in the future.

For various reasons, projections of historical data do not indicate the full potential for further discoveries in a petroleum province. Other methods, some of which may be highly subjective, will have to be used to assess the additional potential. Consequently, the estimate of production from undiscovered fields will always depend to some extent on judgement.