

Petroleum Core Summary Resource for the Taranaki Basin, New Zealand

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Abstract

This paper outlines the development of a new series of summary reports on the petroleum geology of oil and gas producing wells in the Taranaki Basin, New Zealand. The aim of the project was to assemble widely dispersed core data and analysis into an easy-access, standardised information resource that is publically available. This initiative was funded by New Zealand Petroleum and Minerals (NZP&M) and Victoria University of Wellington (VUW) Summer Scholarships programme, and was hosted by GNS Science.

Data collected during the drilling and analysis of petroleum well cores is typically reported and stored in a wide variety of documents and formats, ranging from post drilling well-completion reports to subsequent detailed biostratigraphic analysis and interpretation of depositional settings. Furthermore, various datasets are generated by different organisations for different purposes and at different levels of detail, often many years after the well was drilled. Consequently, there is no consistent centralised repository for the information meaning it can be a difficult and time-consuming task for any interested party to access or assess the petroleum geology of a particular well or area of a basin.

The primary objective of this project was to compile pertinent open access information from five key wells within the Taranaki Basin and present it in a standardised format for each well. The wells selected were Amokura-1, Kupe South-4, Maari-1, Maui-7 and Pohokura South-4. These wells contain cored intervals representing a range of depositional settings that provide a good over-view of the petroleum geology of the basin.

All available data was assembled from well-completion reports written by various operators and obtained through New Zealand Petroleum and Minerals (NZP&M) online database. Additional information was accessed through databases such as GNS Science's Petroleum Basin Explorer database (PBE). Examination of archived cores was also carried out at the NZP&M petroleum core store in Featherston, to characterise specific core intervals and take high-resolution images of representative sedimentary facies.

The report for each well consists of an introduction and essential metadata such as operator name, grid reference, well location (including a map), well total depth, cored intervals, general age model and known production details. Summary descriptions of the stratigraphic units and formations from both drill cuttings and cored intervals are provided along with standard core photos and high-resolution images of key sedimentary features. This is accompanied by biostratigraphic data that includes the age and depositional environment, as well as existing interpretations of various facies models and depositional settings. Aspects of the reservoir geology such as porosity and permeability measurements, hydrocarbon shows (including fluorescence images of hydrocarbon staining, and gas content) were included where available. Finally, a comprehensive reference list is presented along with links to further relevant information such as original petroleum reports, wireline data and additional core photos.

This innovative project successfully summarised key petroleum data from five Taranaki Basin producing wells into a series of convenient, comprehensive reports. The reports are publicly available and it is intended that they will provide useful resources for both domestic and international petroleum prospecting companies. It is envisaged that this project provides a model for further summary reports covering the wider Taranaki Basin and other basins around New Zealand.