magmatic intrusion into the volcanic pile, there has been major structural disruption of the volcanics along the linears trending 310°. This structural displacement may have interrupted a once circular aureole of volcanic related anomalies, now a discordant assemblage.

GIDGINBUNG (EPITHERMAL GOLD)

Little information about this prospect exists in the public domain. However, several similarities can be observed with the Peak Hill area (Fig. 6).

(1) The deposit occurs immediately to the north of an intersection with the Gilmore Suture of a major northeasterly–southwesterly trending linear, which may be an extension of the Parkes Thrust. A less significant east–southeasterly trend cross-cuts both of the abovementioned linears, to the north of Gidginbung.

(2) The deposit occurs along a magnetic low zone within the linear trends of the andesitic volcanics. Again, magnetic depletion due to alteration may be the cause of this feature.

Conclusion

The regional (1:250 000 scale) magnetic and gravity data can be used to map regional geology and structure in this area due to high physical contrasts of shallow volcanic units and deeper basement with sediments and granites.

Copper and gold mineralizing systems can be observed at this scale due to magnetite depletion. Major structural features are observed to intersect in the vicinity of these mineralizing systems.

Acknowledgments

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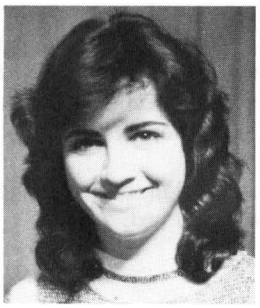

Karen Tenison Woods obtained a BSc(Hons) degree in geophysics from the University of Sydney in 1981 and since then has been employed by the NSW Geological survey. She has been engaged primarily in regional interpretation of magnetic and gravity data for mineral exploration.

K. Tenison Woods and S. S. Webster, Geological Survey of NSW, GPO Box 5280, Sydney, NSW 2001.

The design and use of the Australian Petroleum Exploration Data Index

B. W. Wyatt

Introduction

The concept of the Petroleum Exploration Data Index (PEDIN) database was initiated by the Bureau of Mineral Resource's (BMR) Petroleum Branch. Funding by National Energy Research, Development and Demonstration Council (NERDDC) during 1984 and 1985 has seen the design and implementation of the database by Data Science Pty Limited and B. R. Senior and Associates. Data Science's role was to design and implement the database, to set up a system to manage data in BMR's Core and Cuttings Laboratory, to extract and enter data regarding Petroleum Search Subsidy Act (PSSA) geophysical surveys, and to enter some well data. B. R. Senior and Associates extracted and entered Petroleum Search Subsidy Act (PSSA) well data.

The major objective was to design a system to assist petroleum research and resource assessment by BMR and other organisations, using modern computational techniques.

The lack of a national computerized database of petroleum data has been a major constraint in research into the origin and accumulation of petroleum, and in development and implementation of new resource assessment techniques in BMR, state government departments, and throughout the petroleum exploration industry.

Benefits of the PEDIN system include: rapid access to information for resource assessment, research, exploration, and administration; the ability to relate data from previously disparate sources; the statistical analysis of exploration data on a nationwide basis to determine the adequacy of levels of exploration, trends in exploration activity, and exploration success ratios; production of computer drafted maps and sections; and other matters relevant to Australia's self-sufficiency in energy. The database also has considerable scope for use outside the petroleum exploration industry, especially when data on all regional geophysical surveys are included.

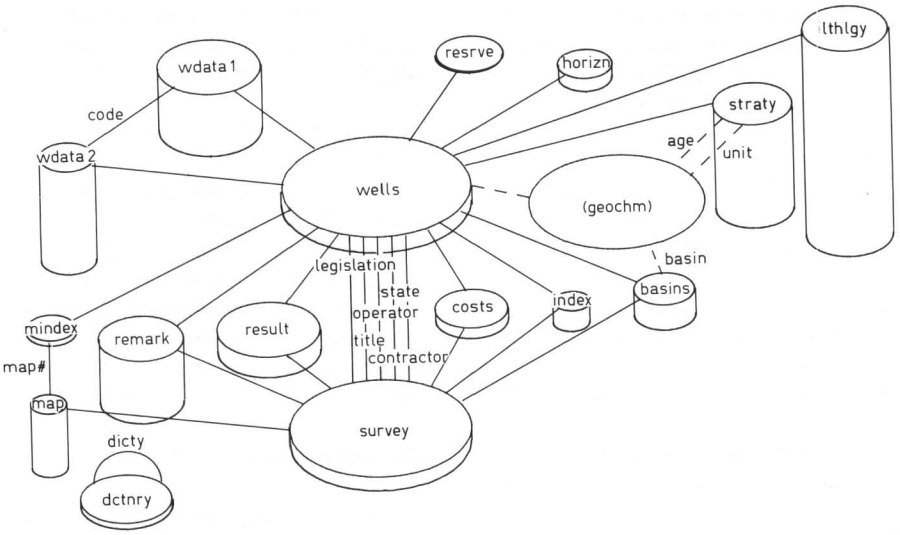

Fig 1 PEDIN data model. Implemented data sets wth key item links. Areas of cylinders represent size of entries. Heights of cylinders represent capacity of sets. Links refer to well/survey number if not labelled. Some less important links are omitted for clarity.

Design

The implemented logical data model for PEDIN is illustrated in Fig. 1. This indicates the main data entities and their relative sizes and relationships. It also indicates the relative physical storage requirements of each data set.

PEDIN was designed using sound information analysis techniques to allow easy modification and portability between different hardware systems and database management systems (DBMS). It is currently installed on HP1000 computer systems using IMAGE DBMS, and on HP150 personal computers using Condor DBMS.

All wells and surveys to be considered were assigned a unique number, then described in various degrees of detail. Many of these basic data, such as the name of a well or survey, the state, year, operator and/or contractor, exist in various tabulated lists and computer files or databases. This basic information has been standardised, edited, checked, and entered into the database. Many of the existing lists and files do not differentiate between geophysical surveys which were carried out for petroleum exploration, and surveys for general research or mineral exploration surveys.

Geophysical surveys are described in terms of location (map sheet areas, coordinates, basins, states), size, techniques, and equipment. References to wells include location (map sheet, coordinates, state, title, basins), stratigraphy, lithology, downhole tests and samples.

The objectives, results, and interpretation of wells and surveys are stored efficiently as unformatted text.

Content and status

PEDIN contains basic information and statistics on petroleum exploration wells and geophysical surveys carried out in Australia, its territories, and PNG.

PEDIN contains data relating to all PSSA wells, aeromagnetic and gravity surveys, and will eventually incorporate all seismic surveys. All other gravity and magnetic surveys catalogued by BMR are included in the database as basic entries.

In addition to data from petroleum exploration wells and geophysical surveys, PEDIN contains references to regional geophysical surveys carried out by BMR and universities, and

Table 1 Status of wells and regional geophysical surveys referenced by the PEDIN database in early 1985. Numbers in parentheses are estimates.

		Wells	Seismic	Gravity	Airborne	Total
PSSA	indexed	750	93	159	89	1091
	summarised	711	93	151	89	1044
	not indexed	0	700	8	0	708
BMR	indexed	0	0	363	252	615
	summarised	0	0	0	0	0
	not indexed	(700?)	(100?)	0	40	(840?)
Other	indexed	0	0	380	34	414
	summarised	0	0	0	0	0
	not indexed	(2550?)	(2000?)	(1000?)	(1000?)	(6550?)
Total	indexed	750	93	902	375	2120
	summarized	711	93	151	89	1044
	not indexed	(3250?)	(2800?)	(1008?)	(1040?)	(8098?)

surveys done by industry for mineral exploration. Therefore the PEDIN database contains references to most regional geophysical surveys in Australia whether related to petroleum exploration or otherwise. These data are available and more accessible for regional sedimentary, structural, and stratigraphic studies. The content of the database in early 1985 is summarised in Table 1. In this table, work is classified as: 'indexed' if a basic data entry has been added to the database; 'summarised' if a full description has been entered; and 'not indexed' if a number has not yet been assigned.

Geophysical surveys and well data are being added to the system as they are commenced, completed, and released. A substantial backlog of information for these remains to be entered into the system to enable its full potential to be realised.

Most of the data entered into PEDIN at this stage have been acquired by government authorities (BMR, State Mines Departments and Geological Surveys) from exploration companies. Government subsidies for petroleum exploration projects approved under the Petroleum Search Subsidy Act (PSSA) provided a major impetus for exploration activities in the period from 1909 to 1974. Under this Act the data and results from subsidised operations were forwarded to government authorities and released to the public after a qualifying period.

Recommendations

The project is described in detail by Wyatt (1985). This report contains chapters describing information analysis techniques and database management systems in general, the PEDIN data model, design, description, and implementation of the actual PEDIN database, and recommendations for future management and use. Appendices include abbreviations, lists of files, and copies of data entry forms.

B. W. Wyatt, Data Science Pty Ltd, PO Box 484, Fyshwick, ACT 2609.

Specific recommendations included in the report include:

(1) The remaining PSSA and open file data on onshore and offshore exploration should be incorporated into the database as soon as possible;

(2) Data from all other currently available wells and surveys should be added to the database as soon as practicable. All future wells and surveys should be added to the database as data become available;

(3) Consideration should be given to the purchase of any existing computerized petroleum exploration databases. The loan, purchase, or copying of individual reports would also be necessary in some instances, in order that PEDIN can ultimately contain all available data;

(4) A system whereby the BMR obtains copies of well completion reports at the release date should be implemented;

(5) Consideration should be given to including reference to other regional geophysical surveys, which were not carried out specifically for petroleum search, but contain data relevant to petroleum search;

(6) The confidentiality and access to data within PEDIN should be investigated, and a consistent policy should be determined, implemented, and monitored;

Facilities should be arranged to allow maximum access to PEDIN. Requirements vary from ad-hoc queries and reports to the establishment of sub-sets of PEDIN on other systems.

The ongoing maintenance of PEDIN is essential to its success. Provision must be made for future publicity, maintenance, advice, and training regarding the database.

Reference

Wyatt B. W. (1985), 'National petroleum exploration database consultancy for Bureau of Mineral Resources, Geology and Geophysics', Data Science unpublished report.