The New Mexico Library of Subsurface Data at NMBMMR

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by *Ronald F. Broadhead*, New Mexico Bureau of Mines and Mineral Resources

Introduction

The New Mexico Library of Subsurface Data is located in the Petroleum Records section of the New Mexico Bureau of Mines and Mineral Resources. It is available for everyone to use, free of charge. The library contains constantly growing collections of: 1) completion cards and scout tickets for petroleum exploration and development wells; 2) drill cuttings (samples) from petroleum exploration and development wells; 3) geophysical logs; 4) descriptions of drill cuttings and cores; 5) driller's logs; 6) oil and gas pool data; 7) county maps showing locations of wells drilled for oil or natural gas; and 8) fusulinid determinations made from drill cuttings. The library also houses a smaller collection of petroleum production data, petroleum-related government publications, and selected journals, magazines, and books germane to the petroleum industry. Map collections donated by the Wilshire Oil Company and geologists Neil Wills, Alberto Gutierrez, and William L. Chenoweth contain subsurface stratigraphic and structural maps of southeast New Mexico. Most data in the library pertain to New Mexico, but selected data from adjacent states and bordering areas of Mexico are also on file. The data have been secured by companies and individuals at a cost of billions of dollars.

The New Mexico Library of Subsurface Data is an important source of information regarding the exploration for, and development of, petroleum, carbon dioxide, helium, coal, uranium, and sulfur resources within New Mexico. It is also an important source of data regarding basic research into the subsurface geology of New Mexico. The library is used by industry geologists and engineers, and faculty and graduate students from New Mexico Tech, New Mexico State University, University of New Mexico, and other universities and colleges. It is also used by geologists and engineers from state and federal agencies, the general public, and the staff of the New Mexico Bureau of Mines and Mineral Resources.

Purpose

The ultimate purpose of the New Mexico Library of Subsurface Data is to benefit the State of New Mexico and its citizens. It does so by providing data on petroleum exploration and development wells to geoscientists and engineers who are striving to better understand the complex geology of New Mexico. That complex geology controls the location of pools of oil and gas and deposits of carbon dioxide, helium, coal, uranium, and sulfur. A better understanding of geology leads to the discovery and development of those resources. When those resources are discovered and developed, jobs are created and incomes rise. In addition, taxes and royalties derived from the production of mineral resources (especially oil and natural gas) fund a large percentage of state programs, such as education, and contribute annually to the state's permanent funds.

The New Mexico Library of Subsurface Data is the sole public repository for drill cuttings and other well data that cover the entire state of New Mexico. It contains the only publicly accessible collection of drill cuttings in New Mexico, the only collection that can be used without charge, and the most complete collection, public or private, in the state. The drill-cuttings collection becomes more important each year because many oil companies, in an effort to save space and money, no longer maintain large, private collections. In addition, many independent operators and small oil companies do not have the financial resources to maintain large collections of cuttings and logs. As a result, many geologists rely on the library as a source of their data.

Data collections

The NMBMMR has placed emphasis on increasing the size and diversity of its collections of completion cards, geophysical logs, and drill cuttings. The New Mexico Library of Subsurface Data has completion cards for more than 85,000 wells, virtually every petroleum exploration and development well ever drilled in New Mexico (Fig. 1). Completion cards contain information pertaining to the well location, basic engineering data, stratigraphic data, drill-stem tests, production tests, records of oil and gas shows, and initial production potentials. Data for completion cards have been obtained from commercial vendors, the New Mexico Oil Conservation Division, the petroleum industry, and the United States Geological Survey. Attempts are made continually to supplement completion data for older wells. New cards are added to the files on a weekly basis as wells are drilled and completed. Recent donations of completion cards have been received from Arapahoe Drilling Company and geologist Myles A. Colligan.

Geophysical logs from approximately 37,000 wells are currently on file in the Library of Subsurface Data. Generally, more than one type of log exists for each well. Geophysical logs, taken after a well has been drilled, provide important geologic data on rocks penetrated by the well and on the fluids present within those rocks and are virtually indispensable when evaluating the oil and gas potential of a well. The logs are used to re- ☞

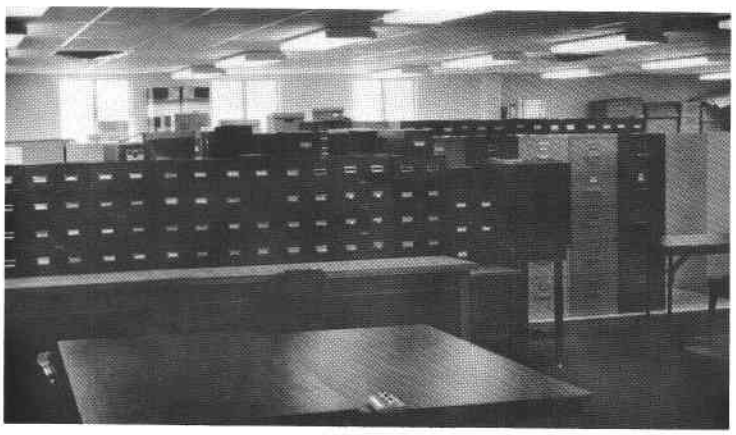


FIGURE 1—Completion cards containing data on more than 85,000 oil and gas wells drilled in New Mexico are stored in these files. The large filing cabinets in the background contain geophysical logs from approximately 37,000 wells.

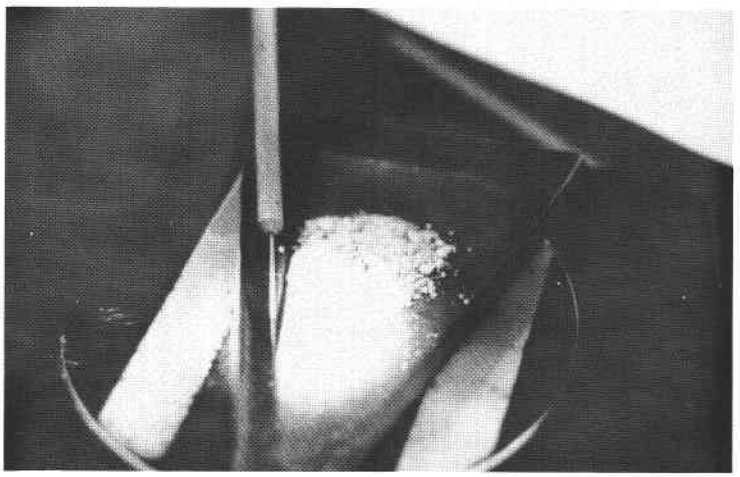


FIGURE 2—Drill cuttings are small pieces of rock ground by the drill bit and are valuable, irreplaceable records of a well.

construct and map the subsurface geology of an area; that reconstruction is important when developing petroleum prospects and planning the locations of new wells. Geophysical logs in the library have been acquired from the New Mexico Oil Conservation Division, the United States Geological Survey, the United States Bureau of Land Management, and private industry.

Approximately 43,500 boxes of drill cuttings from 12,900 wells are currently on file. Drill cuttings are small pieces of rock ground by the drill bit as the well is drilled (Fig. 2). They generally are collected at 10-ft intervals. Each interval is packaged separately, and one box of cuttings contains packages representing from 500 to 1,000 ft of the well (Fig. 3). These drill cuttings are virtually irreplaceable. They are indispensable when analyzing the subsurface geology of an area and provide data that complement geophysical logs and completion cards. The library's collection constitutes the only preserved set of cuttings for many wells drilled in New Mexico. Cuttings are donated to the library by the petroleum industry. In 1987, Yates Petroleum Corporation of Artesia, New Mexico donated their sample library, consisting of 3,800 boxes of cuttings, to the Bureau. Smaller additions and donations are made to the collection on a weekly basis.

Descriptions of drill cuttings and drill cores from approximately 4,300 wells are on file. These descriptions, like geophysical logs and drill cuttings, are valuable when reconstructing and mapping the subsurface geology of an area during exploration for oil, natural gas, and other mineral resources. Cutting and core descriptions have been made through the years by Bureau geologists. Other descriptions have been donated by oil companies and independent petroleum geologists.

Driller's logs from approximately 12,100 wells are on file. The logs are observations and analyses made by drillers, geologists, and engineers at the well site. They provide much valuable data pertaining to the rocks penetrated by the well and often record data on showings of oil and gas.

The Library of Subsurface Data maintains maps and files that illustrate and describe the boundaries of all oil and gas pools in the state. These maps and files are continually updated.

The library maintains and continually updates petroleum exploration maps for most counties. These maps show the location of all oil and gas wells; section, township, and range lines; and larger towns and cities. Names and total depths are shown for most wells. Map scale is 1 inch = 2 miles. Maps are available for all New Mexico counties except Chaves, Eddy, Lea, Rio Arriba, San Juan, and Taos. Paper copies may be purchased at $3.00 per county map.

Lending policies

The New Mexico Library of Subsurface Data does not lend completion cards, geophysical logs, sample descriptions, or other records preserved on paper. All records and data may be freely examined on the premises; limited volumes of paper records may be photocopied at nominal cost. Telephoned or written requests for photocopies will be honored provided information is given regarding specific wells, locations, etc. The purpose of this no-lending policy is to ensure that the maximum amount of material is available to all those who have a need for it.

In a similar manner, a policy has been established that prohibits the lending of drill cuttings. In many cases in the past, lending has resulted in nonreturn, spillage, unauthorized destructive sampling, or other loss. A no-lending policy has been established because most of these cuttings are valuable, irreplaceable records of exploration and development activity. Exceptions to the policy will be made only rarely, and then on a case-by-case basis, provided a request is made in writing and the loan is in the best interest of the state.

Destructive sampling

Several types of analyses require destructive sampling of drill cuttings. The more common types are hydrocarbon source-rock studies, radioactive-age dating, and micropaleontologic–biostratigraphic studies. Generally, destructive sampling of drill cuttings is prohibited. Exceptions will be made if the information derived from such sampling will provide data essential to petroleum exploration and if such data is not publicly available elsewhere. A written request that documents the sampling program must be submitted in advance to the Bureau, and written permission must be obtained from the Bureau. Destructive sampling must not entirely deplete the cuttings from any depth interval of a well; a representative sample of the cuttings must be left after sampling; and the remaining sample must be of sufficient volume to allow routine microscopic analysis. Results of analyses that require destructive sampling must be furnished to the Bureau where they will be placed in the public domain. If the analyses were performed at the expense of private industry, the Bureau will agree to keep the results confidential for a maximum period of one year. All sampling of cuttings must be performed at the Bureau under the supervision of Bureau personnel.

Visitors' facilities

Tables are provided for visitors to examine well data, maps, logs, etc. Drill cuttings may be examined in the sample-examination room equipped with stereoscopic microscopes, ultraviolet-light boxes, and accessory equipment (Fig. 4). Data may be photocopied at a nominal cost that covers expenses of reproduction. Facilities are available to make continuous photocopies of geophysical logs. However, visitors or telephone clients who request copies of large amounts of data or who require blueline copies of geophysical logs are urged to obtain that information from commercial vendors.

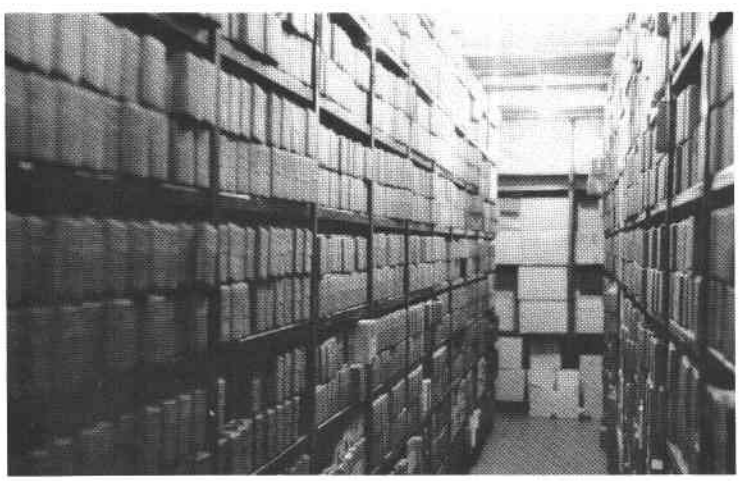


FIGURE 3—Approximately 43,500 boxes of drill cuttings from 12,900 wells are currently on file.

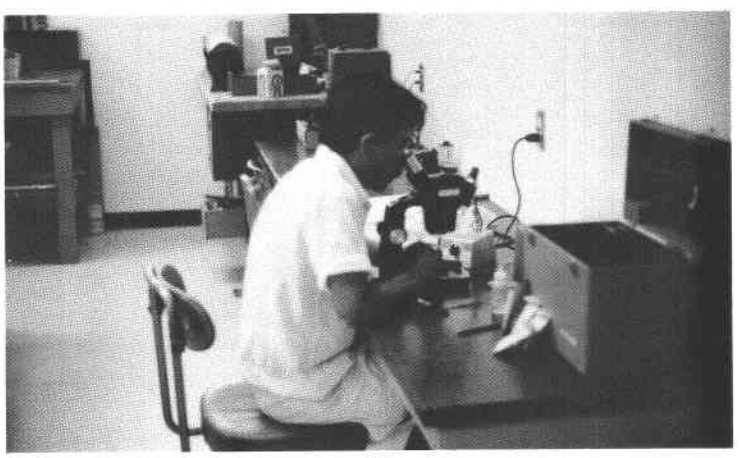


FIGURE 4—The New Mexico Library of Subsurface Data has a sample-examination room for visitors that is equipped with microscopes and other equipment necessary for analysis of drill cuttings.

Future

The New Mexico Library of Subsurface Data will continue to incorporate well-completion data, logs, drill cuttings, and other important data into its collections. Present space is sufficient to accommodate log and sample additions for at least five more years. After that time, space limitations may mandate that donations to the cuttings and log collections be accepted selectively.

A plan has been initiated recently to make well-completion and production data available on computer; it will take from eight to ten years to complete digitization of the data. This form of cataloging on computer will allow users of the library to search more efficiently through well records to find the data they need, thereby saving time and effort that can be better devoted to other phases of their projects.

Complementary facilities at NMBMMR

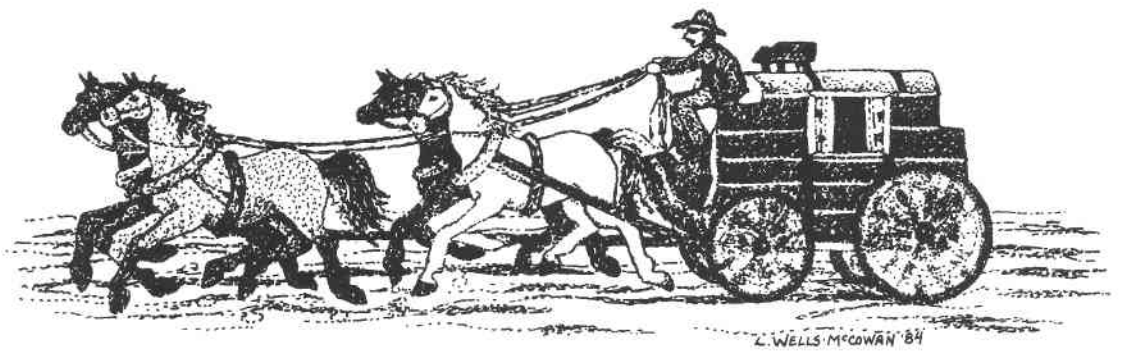
Two additional facilities at the NMBMMR complement the New Mexico Library of Subsurface Data. The Geotechnical Information Center is a repository for records, publications, maps, and other reports pertaining to mines, prospects, mineral industries, and geology of New Mexico. Many documents stored in the Geotechnical Information Center contain information valuable to those exploring for petroleum in the state. The center is managed by Elizabeth Reynolds, (505) 835–5145.

The NMBMMR core library contains numerous drill cores from throughout the state. Although most cores come from holes drilled for mineral prospects, several are from petroleum exploration and development wells. The core library is managed by James Robertson, (505) 835–5125.

Staff and hours

The New Mexico Library of Subsurface Data is manned by three full-time employees of the New Mexico Bureau of Mines and Mineral Resources: Ron Broadhead (Head Petroleum Geologist), Richard Chavez (Assistant Head), and Annabelle Lopez (Petroleum Records Clerk). The full-time staff members are present to process, catalog, and interpret data and to see to the needs of visitors and other clients. Two or three students are employed part-time to process new logs and to wash and process new drill cuttings prior to storage.

The New Mexico Library of Subsurface Data is open Monday through Friday from 8:00 a.m. to 5:00 p.m. The telephone number is (505) 835–5402. □



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