Public Information Circular 15 • September 1999

# The Data Resources Library at the Kansas Geological Survey

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# Introduction

Two of the most important industries in Kansas are agriculture and petroleum. Agriculture, of course, depends on adequate water supplies (both rainfall and groundwater) for livestock watering and crop irrigation. In addition, the human population of Kansas is increasing, and water needs for human use are increasing proportionately. Petroleum resources in Kansas have been exploited for many decades, and consequently they are becoming increasingly difficult to find. Because natural resources are not evenly distributed, both water-well drilling and petroleum exploration depend on information gleaned from previously drilled wells. Archival records of water-well and petroleum drilling activities in Kansas are stored in the Data Resources Library of the Kansas Geological Survey (KGS), as is other information related to water and petroleum, and they are available for public use. This circular describes the information resources available in the Data Resources Library and how they can be used.

### **Data Resources Library**

In 1975, the Kansas Department of Health and Environment (KDHE) began requiring that records be submitted for every water well drilled in the state of Kansas. These records are initially submitted to KDHE. KDHE keeps copies for their own use, but the original forms are forwarded to the KGS Data Resources Library, where they are stored and made available to the public. In a similar manner, completion forms and geophysical logs for oil and gas wells are initially submitted to the Kansas Corporation Commission, but subsequently they come to the KGS Data Resources Library, where they are stored permanently. All of these records and other information about Kansas geology and water and petroleum resources — such as drillers' logs, scout cards, strip logs,

and plugged well information — are available to the public at the KGS Data Resources Library (fig. 1).

### Water

Water-Well Completion Forms (WWC5 forms) for water wells drilled in Kansas since 1975 are on file in the Data Resources Library (fig. 2). Some drillers' records of earlier wells are also on file. They can be viewed and photocopied in the library itself, or requests for photocopies can be submitted by phone or e-mail. These forms contain information about the well's location, ownership, depth, water levels, yield (in gallons



Figure 1. Data Resources Library at the Kansas Geological Survey.

per minute), type of use, borehole diameter, and construction, as well as the name of the well driller and in some cases a driller's log, which indicates the thickness and types of rocks encountered while drilling.

Much of the information in the KGS Data Resources Library is available on the KGS website (www.kgs.ku.edu). A nearly complete listing of water-well records on file at the KGS is available on the website. Information from a large number of these records is also available and is being continually updated; this information includes well location, ownership, depth, water levels, yield, and generalized lithologic log. Scanned images of WWC5 forms also are being added and made available online.

### Oil and Gas

Several types of oil and gas records are available in the Data Resources Library. Over 350,000 wells have been drilled in the state of Kansas (Baars et al., 1993), and the KGS Data Resources Library has records on file for a large number of those wells. The records include Oil and Gas Well Completion Forms (ACO-1 forms) and drillers' logs dating back to the 1920s. These forms generally contain information on well location, lease name, operator's name, depth, formation tops, type of completion, and dates. The library also has geophysical logs from over half of those wells — these are graphic charts of the changes recorded in the physical properties of rocks obtained as various sensing devices (electrical, acoustic, and nuclear) were pulled up through the borehole (fig. 3).

Other oil and gas records on file include scout cards (fig. 4), strip logs, and plugged well information, as well as a compilation of wells drilled into Precambrian rocks, a list of drill cores stored in the KGS Drill Core Storage Facility, and a compilation

|  |                                       |   |   | WELL RECORD                 | Form WW  |  |   | a-1212  |  |   |
|--|---------------------------------------|---|---|-----------------------------|--|--|---|---|--|---|
| LOCATION C   |                                       | ER WELL:  | Fraction  |                             |  | Section Nun  | nber  | Township Numb   | er   | Range Number  |
| County: DOU  | JGLAS<br>lirection                    | from nearest to   | wn or city street ad  | dress of well if located    | d within cit   | v?   |   |   |  |   |
|  |                                       |   | miles west  |                             | a within city  | y :  |   |   |  |   |
| WATER WE   | ELL OW                                | NER:  |   |                             |  |  |   |   |  |   |
| RR#, St. Addre   | ess, Box                              | # :   |   |                             |  |  |   |   |  | ision of Water Resources  |
| City, State, ZIP   |                                       | :   |   |                             |  |  |   | Application Nu  |  |   |
| LOCATE WE<br>AN "X" IN S   | ELL'S LO                              | CATION WITH<br>BOX:   |   |                             |  |  |   |   |  |   |
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| GNA  | VEL FA                                | CK INTERVALS  | From  | ft. to                      |  | ft   |   |   |  | ft.   |
| GROUT MA   | ATERIAI                               | : 1 Neat  |   | 2 Cement grout              |  | entonite   |   |   |  |   |
| Grout Intervals  | : From                                | m 0   | .ft. to 5.4   | ft., From                   |  | ft. to   |   | ft., From   |  | ft. to  |
| What is the ne   |                                       | ource of possible   |   |                             |  |  |   | stock pens  |  | indoned water well  |
| 1 Septic   | tank                                  | 4 Late  | eral lines  | 7 Pit privy                 |  | 11   | Fuel  | I storage   | 15 Oil   | well/Gas well   |
| 2 Sewer  | lines                                 | 5 Ces   | s pool  | 8 Sewage lag                | oon  | 12   | Ferti   | ilizer storage  | 16 Oth   | er (specify below)  |
|  |                                       | er lines 6 See  |   | 9 Feedyard                  |  | 13   | Inse  | ecticide storage  |  |   |
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| FROM   | TO                                    |   | LITHOLOGIC L  | .OG                         | FROM   |  |   |   | GING IN  |   |
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| 12   | 19                                    | Clay-Brow   | wn-Silty  |                             | 63   | 68   | 3   | Sandstone-Gre   | SA   |   |
| 19   | 21                                    | Sandy Sha   | ale   |                             | 68   | 3 70   |   | Shale-Grey  |  |   |
| 21   | 23                                    | Sandy Sha   | ale-Grey  |                             | 70   | 77   | 7   | Sandstone-Gre   | ey   |   |
| 23   | 30                                    | Sandstone   | e-Brown   |                             | 77   | 7 78   | 3   | Shale-Grey  |  |   |
| 30   | 36                                    | Sandstone   | e-Grey  |                             | 78   | 81   |   | Sandstone-Gre   | ey .   |   |
| 36   | 38                                    | Sandy S l   | hale-Grey   |                             | 81   |  |   | Sandstone-Bro   | own  |   |
| 38   | 41                                    | Shaley L  | S-Grey  |                             | 83   |  |   | Shale-Grey  |  |   |
| 41   | 42                                    | Sandstone   | e-Grey  |                             | 84   |  |   | Sandstone-Gre   | ey   |   |
| 42   | 45                                    | Shale-Gre   |   |                             | 87   |  | $3\frac{1}{2}$                                  | Shale-Grey  |  |   |
| 45   | 49                                    | Sandstone   |   |                             | 88   |  |   | Sandstone-Gre   | 5A   |   |
| 49   | 51                                    | Shale-Gre   |   |                             | 97   |  |   | Shale-Grey  |  |   |
| 51   | 56                                    | Sandstone   |   |                             | 10   |  |   | Sandstone-Gre   | ey.  |   |
| 56   | 59                                    | Shale-Gre   | ey  |                             | 13   | 30 l 131   | L   | Limestone-Gre   | ey   |   |
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| INSTRUCTIO   | NS: Use ty                            | pewriter or ball poin   | t pen. PLEASE PRESS FI  | RMLY and PRINT clearly. Ple | ease fill in bla                                       | inks, underline  | or circ   | cle the correct answers. Send   | top three co   | pies to Kansas Department   |
| of Health and  | d Environn                            | nent, Bureau of Wate  | r, ropeka, Kansas 66620   | -uuu1. Telephone: 913-296-5 | 5545. Send or  | ne to WATER W  | rctt (  | OWNER and retain one for you  | our records.   |   |

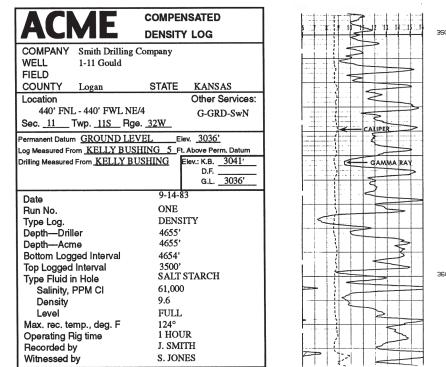
Figure 2. Example of a Water-Well Completion Form (WWC5) for a well in Douglas County. Note: Although the legal description of the well location and the owner's name and address were removed from this example, this information is essential and is required on all forms.

of information on oil-field brines of Kansas. The Data Resources Library also subscribes to purchased data, which are available for viewing in the library. These include new drilling locations, new completions, currently operating wells, production histories and reports, and other information pertaining to Kansas oil and gas activities.

Oil and gas information available on the KGS website includes production data (county, field, lease, top 10 counties), digitized geophysical logs in LAS (Log ASCII Standard) format for a few wells, a listing of paper copies of electric logs available in the Data Resources Library, plugged-well information, a listing of rotary cutting samples available in the Wichita branch of the KGS, and a listing of drill cores stored in the KGS Core Library in Lawrence.

### **Data Uses**

Landowners interested in drilling a water well may want to obtain copies of WWC5 forms for nearby wells. This information, along with information in other publications, can help them to assess the possibilities



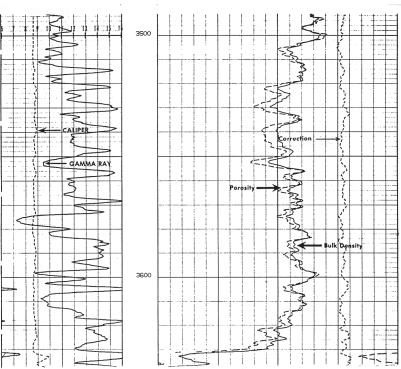


Figure 3. Sample geophysical well log based on actual data from an oil well in Logan County, Kansas. (A) The header lists the well's location and ownership and provides other information about the drilling of the well. K.B. = Kelly Bushing, D.F. = Drill Floor, and G.L. = Ground Level. (B) The curves indicate geophysical and electrical properties of the layers of rocks down the hole. Many older wells, particularly in eastern Kansas, have had no geophysical logs taken, whereas many recent wells may have sets of at least five or more different curves for each well.

| FIELD:<br>OPER:<br>WELL:                                       | KANSAS COMENDELBURG NO GENERAL ATLAN 1 RUSSELL 15-185-22956 04/16/94 3746 LTD:   |  | MI S BROCK FLD  WELL CLASS: W STATUS: OIL COMP: 05/21/94 | 13-23S-12W<br>SE SW SE<br>500 FSL 1700 FEL SEG<br>FD ELEV: 1848 KB<br>1840 GR<br>PBTD: |  |  |  |  |
|--|--|--|--|--|--|--|--|--|
| LOC:   | 1 1/2 MI NE BEDFORD, KS  |  |  |  |  |  |  |  |
| IP:  | COMP 5/21/94, IPP EST 32 BO, 50 BWPD <b>PROD ZONE</b> - ARBUCKLE 3734-3746(OPENHOLE)<br>NO CORES, FOUR DSTS (ARBUCKLE DISCOVERY - NEW FIELD) |  |  |  |  |  |  |  |
| LOG TO<br>STONE CO<br>HEEBNER<br>DOUGLAS<br>BROWN L<br>LANSING | ORRAL<br>S   | 611 1237<br>3172 -1324<br>3206 -1358<br>3314 -1466<br>3341 -1493 | B/ KANSAS CITY<br>VIOLA<br>SIMPSON<br>ARBUCKLE           | 3593 -1745<br>3614 -1766<br>3673 -1825<br>3730 -1882                                   |  |  |  |  |
| TD   |  | 3746 -1898   | 1  |  |  |  |  |  |
| LOG TYI<br>CSGS:   | PES: BHCS, CNDL,<br>8 5/8 @ 406 W/22<br>04/25/94   |  | 4 W/150 SX; <b>TBG:</b> 2 3/8                            | 3 @ 3732; DRLG COMP  |  |  |  |  |
|  |  | (0)  | /ER)   | /95CARD #00050-KS  |  |  |  |  |

Figure 4. Example of a scout card for an oil well in Stafford County. These cards contain information about the name, date, location, and ownership of the well, as well as producing zones and formation tops. Additional information is available on the backs of some cards (reproduced with permission from Petroleum Information/Dwights).

of success in water-well drilling and make better judgments about where to locate their well. Estimates can be made about drilling depths, potential yields, and the types of rocks that may be encountered while drilling. Information about general hydrological conditions may also be gleaned from these records. Questions concerning these matters may be addressed to KGS staff, who are available for answering public inquiries. It is helpful if such inquiries are accompanied by legal descriptions of the properties involved (i.e., quarter, section, township, and range).

Anyone interested in Kansas oil and gas may find the records stored at KGS useful. The completion forms, scout cards, and geophysical logs can be used to make inferences about depths from the surface to various formations and intervals, characteristics of those intervals, and indications about the presence, quantity, and recoverability of oil and gas. KGS staff are also available to answer questions concerning oil and gas.

Other geological studies can benefit from the information available in

the Data Resources Library as well. Stratigraphic studies involving regional correlations, hydrological and ecological studies, structural investigations, and geological engineering concerns may be enhanced by using the subsurface data available in these records.

## **Access**

Access to records stored at the KGS Data Resources Library can be obtained by

- 1. a personal visit to the Library (1930 Constant Ave., Lawrence, KS),
- a phone call (785-864-3965),
- 3. an e-mail message (datares@kgs. ku.edu), or
- 4. by visiting the KGS website (www. kgs.ku.edu) to view or download certain records.

Anyone may use the Library facilities free of charge, but a small fee may be charged for photocopies of records. Publications produced by the Kansas Geological Survey on certain areas of the state or on subjects pertinent to the geological and hydrological resources of the state may be purchased through Publications Sales at the KGS.

# **Summary**

Archival records of water-well and oil and gas well drilling activities stored at the Data Resources Library of the Kansas Geological Survey are easily accessible to the public in paper and electronic form. Other related information also is available. This information may be obtained by visiting or calling the Data Resources Library or by visiting the KGS website. Such information resources can be useful to those considering drilling for water or for oil and gas in Kansas.

### References

Baars, D. L., Watney, W. L., Steeples, D., and Brostuen, E. A., 1993, Petroleum--A primer for Kansas: Kansas Geological Survey, Educational Series 7, 40 p.



The University of Kansas

The Kansas Geological Survey (KGS) is a research and service division of the University of Kansas that investigates and provides information about the state's natural resources. KGS scientists pursue research related to surface and subsurface geology, energy resources, groundwater, and environmental hazards. They develop innovative tools and techniques, monitor earthquakes and groundwater levels, investigate water-quality concerns, and map the state's surface geology.

The KGS has no regulatory authority and does not take positions on natural resource issues. The main headquarters of the KGS is in Lawrence in the West District of the University of Kansas, and the Kansas Geologic Sample Repository of the KGS is in Wichita.

Public Information Circular 15 September 1999

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