DESCRIPTION OF WATER-RESOURCE-RELATED DATA COMPILED FOR RENO COUNTY, SOUTH-CENTRAL KANSAS

By Cristi V. Hansen

U.S. GEOLOGICAL SURVEY
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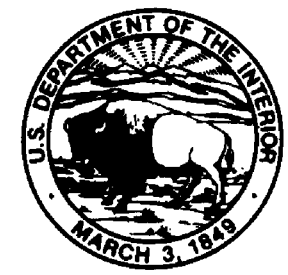
Prepared in cooperation with the
RENO COUNTY HEALTH DEPARTMENT



Lawrence, Kansas
1993

U.S. DEPARTMENT OF THE INTERIOR

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	*By*	*To obtain*
inch	2.54	centimeter
foot	0.3048	meter
mile	1.609	kilometer
square mile	2.590	square kilometer
acre	0.4047	hectare
gallon	3.785	liter
gallon per minute	0.06309	liter per second

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929--a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

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By Cristi V. Hansen

ABSTRACT

Water-resource-related data for sites in Reno County were compiled in cooperation with the Reno County Health Department as part of the Kansas Department of Health and Environment's Local Environmental Protection Program (*LEPP*). These data were entered into a relational data-base management system (*RDBMS*) to facilitate the analysis required to meet the *LEPP* goals of developing plans for nonpoint-source management and for public-water-supply protection. The data in the *RDBMS* are organized into digital data sets. The data set **RNUSGS** contains site, construction, geologic, water-level, and water-quality data compiled by the U.S. Geological Survey for 958 wells. The data set **RNWWC5** contains site, construction, and geologic data compiled by the Kansas Department of Health and Environment for 3,936 wells. The data set **RNHEQW** contains site and water-quality data compiled by the Kansas Department of Health and Environment for 51 wells, 18 public-water-supply distribution systems, and 7 streams. The data set **RNDWR** contains site and water-withdrawal data compiled by the Division of Water Resources of the Kansas State Board of Agriculture for 643 wells and 23 streams or surface-water impoundments. The data set **RNDRLG** contains site, construction, and geologic data compiled by well-drilling contractors and the Kansas Geological Survey for 96 wells. The data in these five data sets are available from the Reno County Health Department in Hutchinson, Kansas.

INTRODUCTION

The State Water Resources Planning Act established "the protection and improvement of the quality of the water supplies of the state" and "the prevention of the pollution of the water supplies of the state" as two of the State's long-range goals (Kansas Statutes Annotated 82a-903 et seq.). Recommendations on how to achieve these goals are contained in the Kansas Water Plan. The Local Environmental Protection Program (*LEPP*) was developed in response to a recommendation in the Kansas Water Plan for the development of partnerships between State and local agencies (such as county health departments or water districts) for the purpose of protecting the quality of the environment. The *LEPP* began in 1989 with the passage of a law by the Kansas Legislature that declares "the State of Kansas shall provide state environmental protection grants to local health departments or other local entities for the purpose of developing and implementing environmental protection plans and programs" (Kansas Statutes Annotated 75-5657). Local agencies are encouraged by the Kansas Department of Health and Environment (*KDHE*), through the auspices of the *LEPP*, to "establish and operate programs for the prevention and correction of sources of pollution that degrade water quality" as part of a comprehensive Local Environmental Protection Plan for "the management of pollutant sources which may effect water quality" (Kansas Department of Health and Environment, 1991).

The *KDHE* identifies two of the objectives to be included in a Local Environmental Protection Plan as development of a nonpoint-source management plan and development of a public-water-supply protection plan (Kansas Department of Health and Environment, 1991). To meet these objectives, local agencies need (1) to identify the sources of existing water supplies, (2) to define the quality of water from these sources, and (3) to delineate the areas where these sources are contaminated or susceptible to contamination. The analysis needed to meet the objectives of the *LEPP* requires water-resource-related (site, construction, geologic, water-level, water-quality, and water-withdrawal) data. Most local agencies do not have enough water-resource-related data to perform these tasks; fortunately, large quantities of water-resource-related data exist in the files of Federal, State, and county agencies, water districts, and privately owned companies. Compilation of these existing data is a logical first step in developing nonpoint-source and public-water-supply management plans as a part of the *LEPP*.

After compilation, these large quantities of existing water-resource-related data may be entered into a relational data-base management system (*RDBMS*) to facilitate the management of these data and to facilitate analysis using these data. A *RDBMS* is a powerful, computer-based tool for the storage, organization, retrieval, manipulation, analysis, and display of tabular data. The advantages of using a *RDBMS* include: (1) improved data access; (2) the ability to perform complex queries; (3) the ability to access multiple data sets simultaneously; and (4) the ability to facilitate existing analysis procedures. Analyses performed using an *RDBMS* generally are less cumbersome, and the results are more consistent and reproducible than those derived manually.

Purpose and Scope

This report describes the site, construction, geologic, water-level, water-quality, and water-withdrawal data compiled for Reno County in cooperation with the Reno County Health Department from June 1991 through September 1992. Specifically, this report describes the types of data compiled, the sources of these data, and the format and size of the files in which these data are stored (tables 1-15 in this report). The data are available from the Reno County Health Department (Hutchinson, Kansas) and are not included in this report. This compilation of existing water-resource-related data is one of several being conducted in Kansas by the U.S. Geological Survey (*USGS*) in cooperation with local agencies.

Acknowledgments

The data described in this report could not have been compiled without the assistance of many people and agencies. The *KDHE* contributed digital data files containing water-well completion (*WWC5*) records and water-quality analyses. The Division of Water Resources (*DWR*) of the Kansas State Board of Agriculture contributed digital data files containing information about sites where water diversions are permitted. The Kansas Geological Survey (*KGS*), Darling Drilling Company (Hutchinson, Kansas), and Rosencrantz-Bemis Enterprises, Inc. (Great Bend, Kansas) allowed the author to copy selected drillers' logs from their files.

DESCRIPTION OF *RDBMS* FILES

The *RDBMS* files described in this report contain water-resource-related data for 5,732 ground- and surface-water sites in Reno County. The types of water-resource-related data in these files include site, construction, geologic, water-level, water-quality, and water-withdrawal data. Basic site data include such types of data (attributes) as location, current or past ownership, use of water, and recorded pumping rate. If the site is a well, construction (well depth, casing or screen depth, date of construction), geologic (including lithology encountered and aquifer that is the primary source of water to the well), and water-level data may be included.

The INFO[1] (Henco Software, Inc., 1991) *RDBMS* was used to store and manage the water-resource-related data compiled for the Reno County Health Department during this study. The files described in this report are organized within the INFO *RDBMS* into digital data sets. A data set consists of an organized group of interdependent tabular files on a single theme. The five data sets described in this report contain water-resource-related data for sites in Reno County, most of which are wells. The theme that distinguishes these data sets from each other is the source of the data. Data in the data sets are what were available as of July 1991 from each agency. Locations of sites in the compiled data were not verified.

Data Sets

A naming convention was used for data-set names and for names of all the files in the data sets. All data-set names begin with the two-letter vehicle license-tag abbreviation for Reno County (RN) followed by a three- to four-letter abbreviation for the source of the data. The file names in the data set all have the five- to six-letter data-set name as the root followed by a period and a three-letter suffix, which is an abbreviation for the type of information stored in the file. The file-name suffixes and the number of records (that is, lines or entries) included in each of the files in each

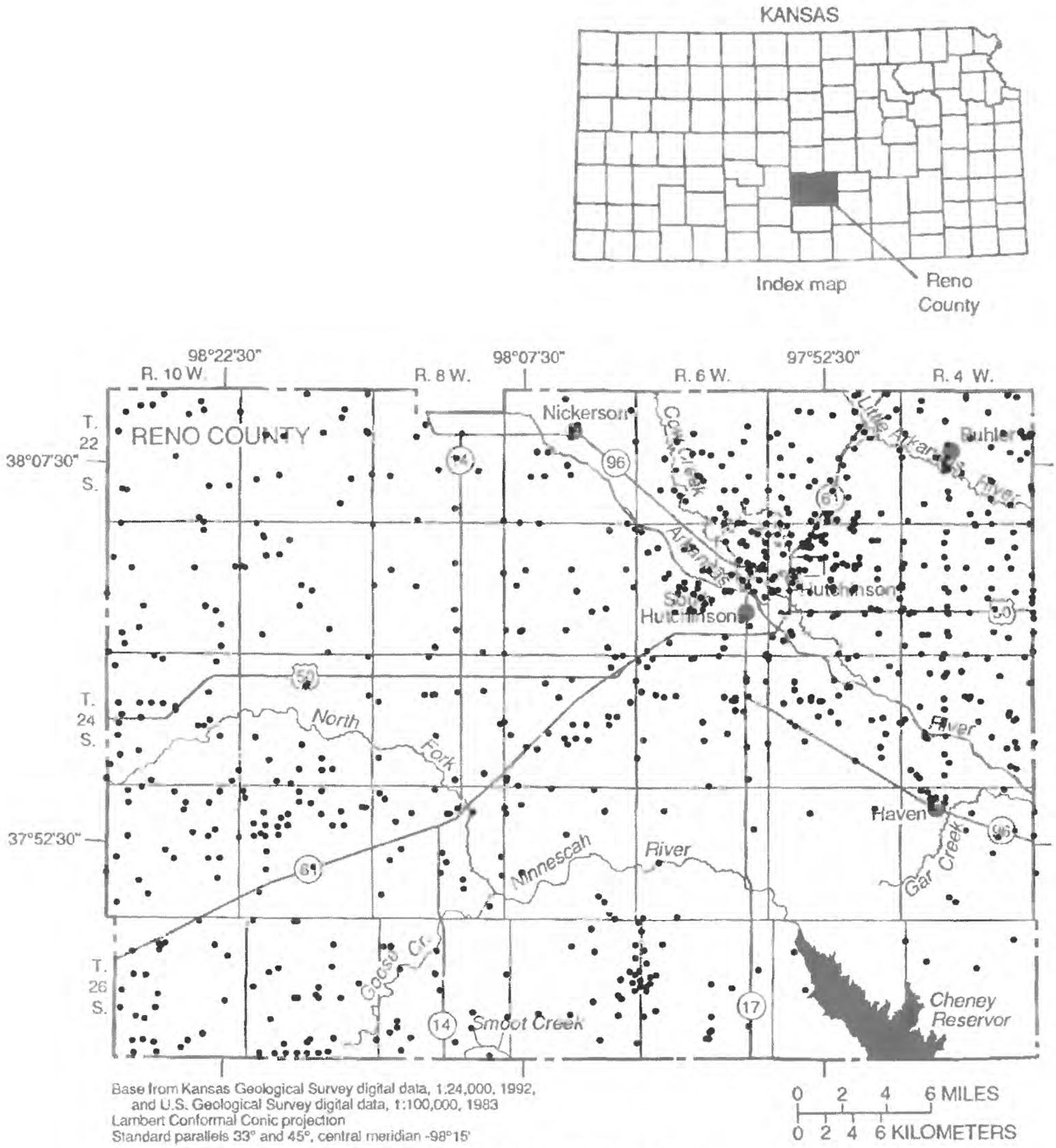
[1] The use of trade names is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Table 1. *Number of records in files in each data set compiled for Reno County*

[Numbers are number of records (lines or entries) for each data-set file. --, no records or file]

File-name suffix	Type of information in file	Data-set name[1]				
		RNUSGS	**RNWWC5**	**RNHEQW**	**RNDWR**	**RNDRLG**
HED	Site or header descriptions	958	3,936	76	666	96
CAS	Well-casing descriptions	607	1,612	--	--	13
GRT	Grouting descriptions	93	1,592	--	--	--
SCR	Well-screen descriptions	105	3,887	--	--	10
LTH	Lithologic descriptions	33	3,975	--	--	90
AQF	Aquifer identifications	696	--	--	--	--
GWL	Ground-water levels	--	1,303	--	--	--
RWL	Recurring water levels	4,037	--	--	--	--
SAM	Sample information	1,040	--	297	--	--
CON	Water-quality constituent results	17,166	--	9,592	--	--
WUD	Water withdrawals	--	--	--	666	--
NAR	Narrative descriptions	201	201	201	201	201
ATT	Attribute descriptions	118	105	57	57	89

[1] **RNUSGS**, U.S. Geological Survey's National Water Information System; **RNWWC5**, Kansas Department of Health and Environment's water-well completion file; **RNHEQW**, Kansas Department of Health and Environment's water-quality-analyses file; **RNDWR**, Division of Water Resources of the Kansas State Board of Agriculture's file of sites where water is permitted to be diverted; and **RNDRLG**, well-drilling contractors' and Kansas Geological Survey's drillers'-logs files.



EXPLANATION

• WELL--One symbol may represent many closely spaced wells

Figure 1. Location of wells in U.S. Geological Survey (**RNUSGS**) data set. Plotted locations are based on locational information supplied by the U.S. Geological Survey and were not verified.

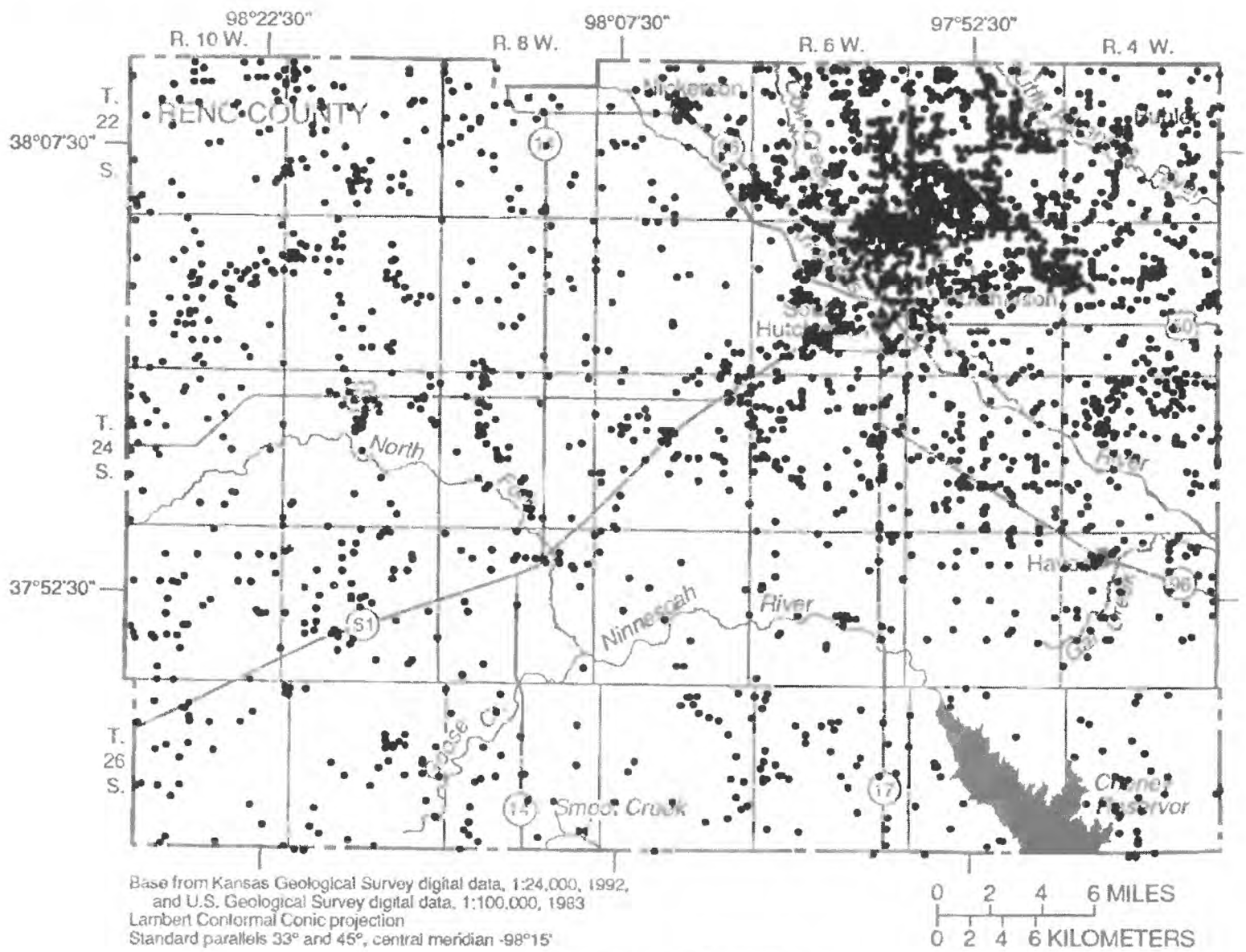
data set are listed in table 1. The types of files are explained in a subsequent section of this report.

The data set **RNUSGS** contains site, construction, geologic, water-level, and water-quality data for 958 wells in Reno County (fig. 1) from the *USGS* National Water Information System (*NWIS*). *NWIS* is the official computerized archive for all water-resource-related data collected or analyzed by the *USGS*. The well locations shown in figure 1 are based on latitude and longitude coordinates

stored in *NWIS*. For many wells in Kansas with information stored in *NWIS*, *USGS* personnel used the KANS (Morgan and McNellis, 1969) or LEO (Ross, 1989) computer programs to convert the well's location from one defined by a modification of the U.S. Bureau of Land Management's (*BLM*) system of land subdivision to latitude and longitude coordinates. The conversions were performed at the time information about the well was first stored in *NWIS*. None of the well locations in the data set **RNUSGS** were verified.

The data set **RNWWC5** contains site, construction, and geologic data for 3,936 wells in Reno County (fig. 2) that were obtained from the *KDHE*'s file of water-well completion (*WWC5*) forms. Since January 1, 1975, well drillers have been required to submit a *WWC5* form to the *KDHE* for each water well they drill. The well locations shown in figure 2 were determined using the LEO computer program (Ross, 1989) to convert each well's location from one provided by *KDHE*, and defined by a modification of the *BLM's* system of land subdivision, to latitude and longitude coordinates. None of the well locations in the data set *RNWWC5* were verified.

The data set **RNHEQW** contains site and water-quality data for 51 wells, 18 public-water-supply distribution systems, and 7 streams in Reno County for which *KDHE* has



EXPLANATION

• WELL--One symbol may represent many closely spaced wells

Figure 2. Location of wells in Kansas Department of Health and Environment's water-well completion (**RNWWC5**) data set. Plotted locations are based on locational information supplied by the Kansas Department Health and Environment and manipulated using the LEO program (Ross, 1989). Locations were not verified.

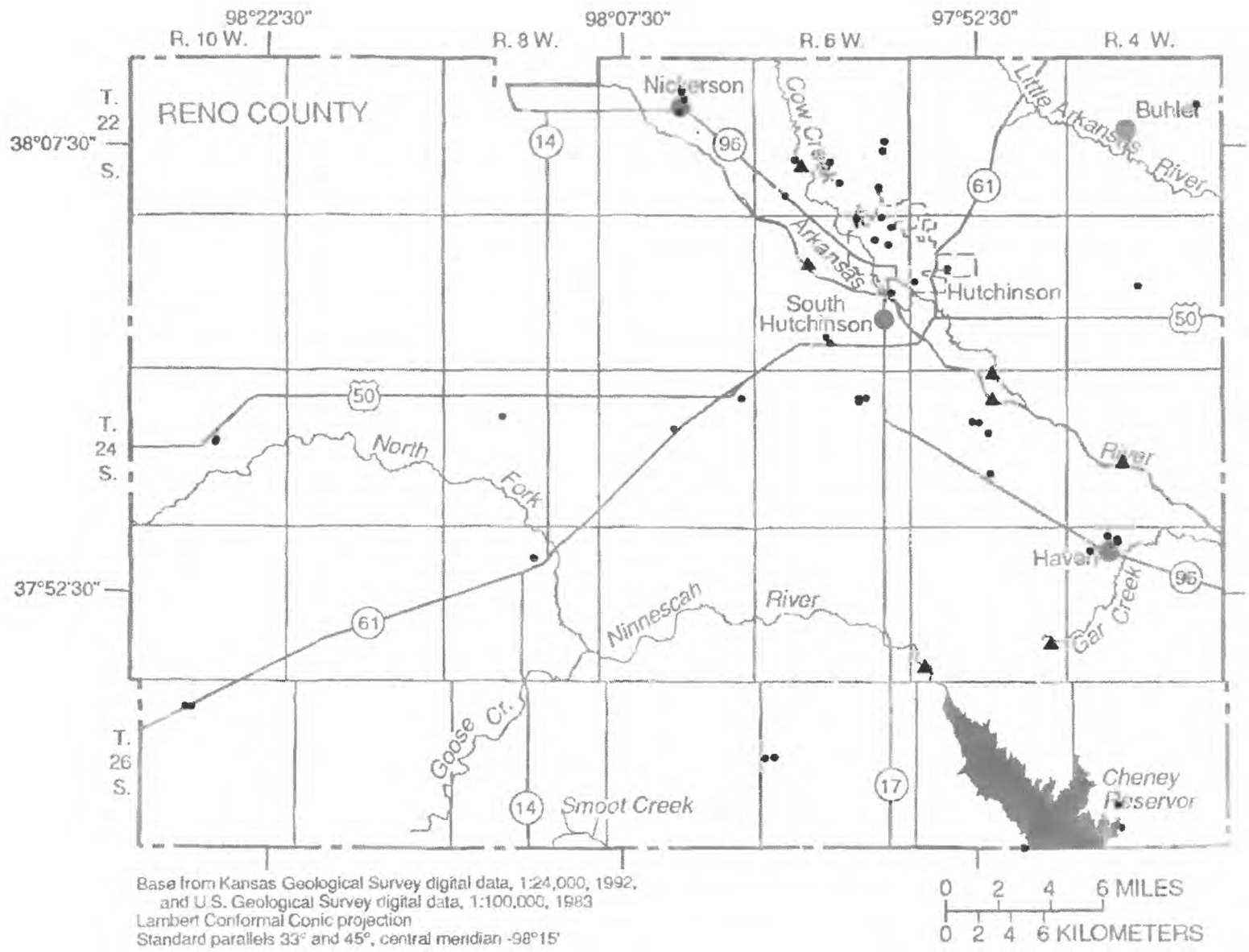


Figure 3. Location of sampling sites in Kansas Department of Health and Environment's water-quality-analyses (**RNHEQW**) data set. Plotted locations are based on locational information supplied by the Kansas Department of Health and Environment and were not verified.

based on the latitude and longitude coordinates provided for these sites by the *KDHE*. The 18 public-water-supply distribution-system sites are not shown in figure 3 because latitude and longitude coordinates were not supplied for these sites by the *KDHE*. None of the sampling-site locations in the data set **RNHEQW** were verified.

The data set **RNDWR** contains site and water-withdrawal data for 643 wells and 23 streams or surface-water impoundments where water diversions are permitted by *DWR* in Reno County (fig. 4). Permits to divert water are not required for sites where the water is diverted for domestic use only. The site locations shown in figure 4 were determined using the LEO computer program (Ross, 1989) to convert each site's location from one provided by *DWR*, and defined by a modification of the *BLM*'s system of land subdivision, to latitude and longitude coordinates. None of the site locations in the data set **RNDWR** were verified.

The data set **RNDRLG** contains site, construction, and geologic data for 96 wells in Reno County that were drilled before January 1, 1975 (fig. 5). Data about these wells were compiled from the files of well-drilling contractors and the *KGS*. The well locations shown in figure 5 were determined using the LEO computer program (Ross, 1989) to convert each well's location from one provided by the well-drilling contractor or the *KGS*, and defined

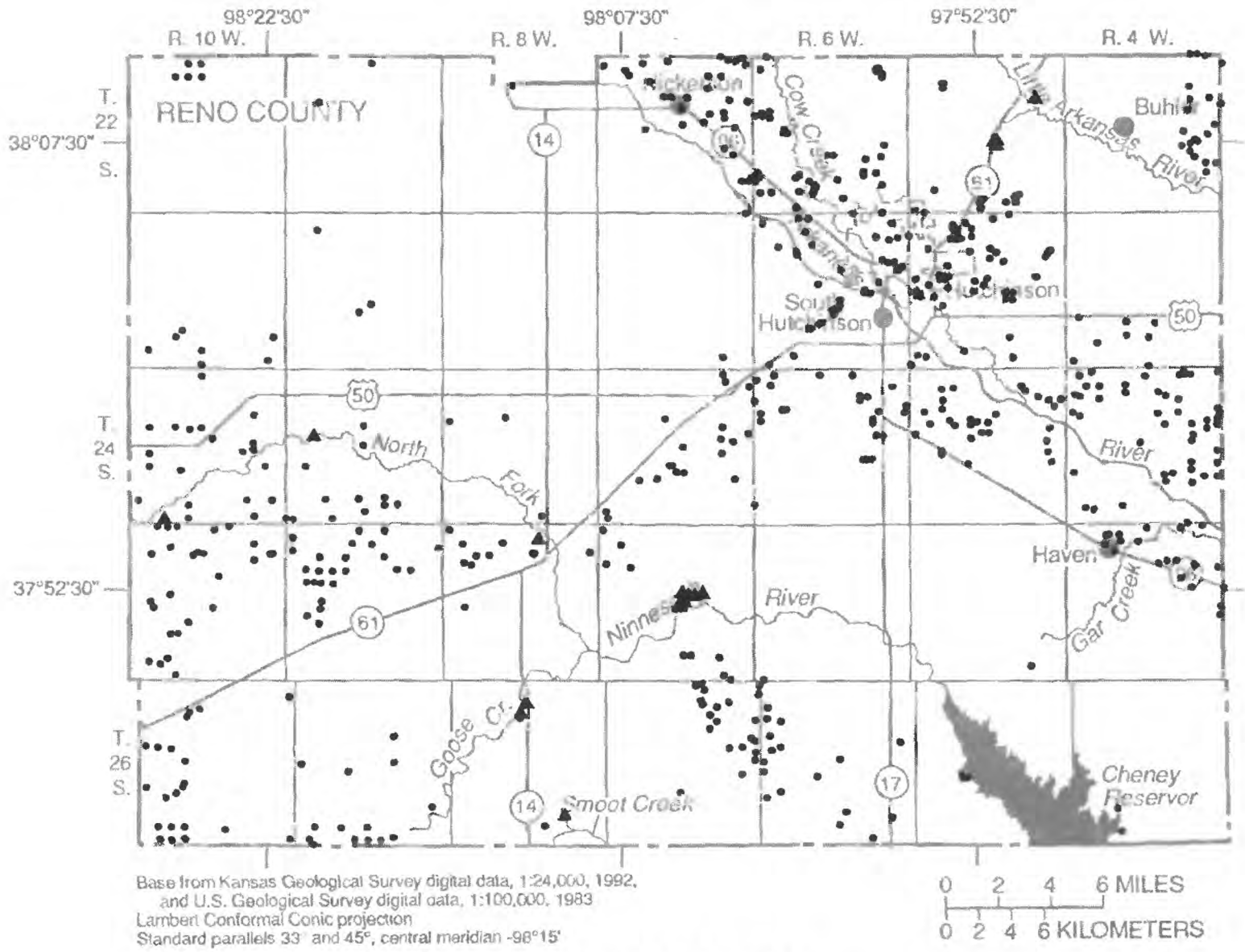


Figure 4. Location of sites in Division of Water Resources of the Kansas State Board of Agriculture's water-withdrawal (**RNDWR**) data set. Plotted locations are based on locational information supplied by the Division of Water Resources of the Kansas State Board of Agriculture and manipulated using the LEO program (Ross, 1989). Locations were not verified.

by a modification of the *BLM*'s system of land subdivision, to latitude and longitude coordinates. Eighteen of the wells are not shown in figure 5 because their locational information was incomplete, and therefore, latitude and longitude coordinates could not be determined. None of the well locations in the data set **RNDRLG** were verified.

Each data set consists of data files that contain attribute data about the sites in the data set. Information defining the codes used in the data files are in the explanation files; the explanation files are used by all the data sets and are not part of any one data set. The information in the data and explanation files is stored in a tabular format; each column heading (field) of the tabular format is called an item, and each line in the file is called a record. Some files have a record for each site in the data set, some may have more than one record for a particular site in the data set, and some may not have any records for a particular site in the data set. The item ORIG_ID is used to uniquely identify each site in a data set and can be used to cross reference data about each site that are

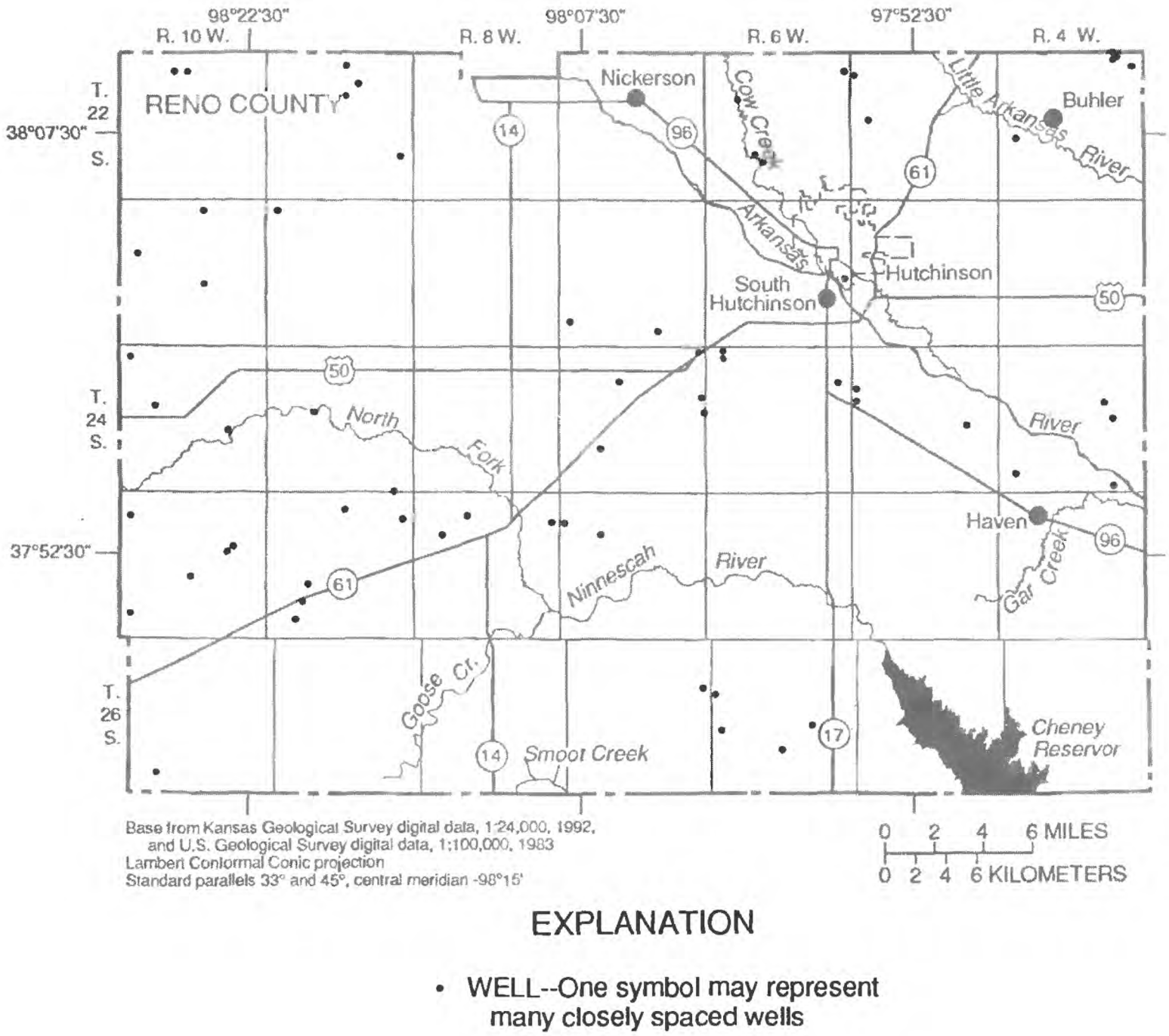


Figure 5. Location of wells in well-drilling contractors' and Kansas Geological Survey's drillers'-logs (**RNDRLG**) data set. Plotted locations are based on locational information supplied by well-drilling contractors and the Kansas Geological Survey and manipulated using the LEO program (Ross, 1989). Locations were not verified.

contained in the different files within the same data set. The following text and tables 2-15 of this report describe the type of data and items contained in each of the data-set files.

Data Files

The data files in a data set contain site-attribute data as well as documentation for the data set. Site-attribute data include the location, construction, lithology, aquifer-identification, water-level, water-quality, and water-withdrawal data available for each site. Not all data sets will have data files for all these attributes (table 1).

Files with the HED suffix contain basic site or "header" information, such as location, ownership, and availability of other types of data in other files in the data set. Table 2 contains descriptions of the items in the files with the HED suffix. The items TWP_RNG_SEC and QUALIFIERS described in table 2 contain the definition of each site's location using one of three site-location systems that are modifications of the *BLM*'s system of land subdivision.

Table 2. *Description and format of header (HED) files*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
AGENCY_IDS	56	Unique identifiers assigned by Federal and State agencies to the site. Columns 1-15 contain an identifier assigned by the U.S. Geological Survey that generally is based on the latitude and longitude of the site's location and a two-digit sequence number; columns 17-24 contain an identifier assigned by the Kansas Department of Health and Environment to water-quality sites; columns 26-36 contain an identifier assigned by the Kansas Department of Health and Environment that is based on the site's township-range-section location and a four-digit extended key (sequence number); columns 37-56 contain an identifier assigned by the Division of Water Resources of the Kansas State Board of Agriculture that is based on the site's application or vested-right code number, township-range-section and qualifiers location, and a two-digit sequence number. Columns 16 and 25 are blank.
DWR_FILE_ID	9	Application or vested-right code number assigned by the Division of Water Resources of the Kansas State Board of Agriculture. If vested right, first two letters are the vehicle license-tag code for Reno County (RN).
SITE_TYPE	1	Code for type of site. See code-description file SITYPE.DES for explanation of codes (table 15).
COUNTY	3	Federal Information Processing System (FIPS) code for the county name. Reno County's FIPS code is 155.
TWP_RNG_SEC	7	Township, range, and section of site's location (TTRRRSS). The site's location is based on a modification of the U.S. Bureau of Land Management's system of land subdivision. The first two digits indicate the township south of the Kansas-Nebraska State line, the next two digits indicate the range followed by a letter indicating if the range is east (E) or west (W) of the sixth principal meridian, and the last two digits indicate the section in which the site is located. See figure 6 for example.

Table 2. *Description and format of header (HED) files*--Continued

Item name	Number of columns in item	Item description
QUALIFIERS	8	Location of site within the section defined using one of three site-location systems (the section is defined in item TWP_RNG_SEC). System 1 is an eight-digit number in which the first four digits are the number of feet north and the last four digits are number of feet west of the southeast corner of the section. For the remaining two systems, the location of the site within the section is given in terms of progressively smaller subdivisions of the section. System 2 is a two- to eight-character code in which the two-character codes NE, NW, SE, SW, E2, N2, S2, W2, CE, CN, CS, CW, or NC are used to identify the subdivisions and the direction of these subdivisions within the section. The subdivisions represent progressively smaller areas within the section when read from right to left, with each subsequent code defining a subdivision and the subdivision's direction within the subdivision represented by the code to its right. System 3 is a one- to four-letter code in which the one-character codes A, B, C, or D (equivalent to NE, NW, SW, and SE in system 2, respectively), are used to identify the subdivisions and the directions of these subdivisions within the section. The subdivisions represent progressively smaller areas within the section when read from left to right, with each subsequent code defining a subdivision and the subdivision's direction within the subdivision represented by the code to its left. See code-description file QUALFR.DES for explanation of codes (table 15). See figure 6 for examples of these three site-location systems.
PLACE_ACCURACY	1	Code for accuracy with which the site was located. See code-description file PLACC.DES for explanation of codes (table 15).

Table 2. *Description and format of header (HED) files*--Continued

Item name	Number of columns in item	Item description
ADDRESS	75	Columns 1-75 contain the address, location, or directions to site in the Kansas Department of Health and Environment's water-well completion data set (**RNWWC5**). Columns 1-18 contain the first alias (alternate name assigned by the agency to the site), columns 21-38 contain the second alias, and columns 41-58 contain the third alias of the site in the Kansas Department of Health and Environment's water-quality-analyses data set (**RNHEQW**). Columns 1-6 contain the address code of site owner in the Division of Water Resources of the Kansas State Board of Agriculture's water-withdrawal data set (**RNDWR**). This item is blank in the U.S. Geological Survey (**RNUSGS**) data set. The first two characters of alias names in data set **RNHEQW** are codes for the use of the site; see code-description file ALIBEG.DES for explanation of these codes (table 15).
OWNER	15	Name of site owner.
WELL_DEPTH	4	Depth to bottom of well, in feet below land surface.
LAND_SURFACE	4	Altitude of land surface, in feet above sea level.
STATIC_WL	4	Depth to static water level in feet below land surface; measured at the time well construction was completed.
HOURS_PUMPED	3	Number of hours well was pumped during pump test. Test was performed at the time well construction was completed for data set **RNWWC5**; test may have been performed at a later time for data set **RNUSGS**. This item is blank in all other data sets.
YIELD_GPM	4	Well yield from aquifer test, in gallons per minute.
EST_YIELD	4	Estimated well yield, in gallons per minute; no aquifer test was performed.
WATER_USE	2	Code for use made of water withdrawn from site. See code-description file WATUSE.DES for explanation of codes (table 15).
CONTAM_TYPE	2	Code assigned by the Kansas Department of Health and Environment identifying type of the potential source of contamination nearest the site. See code-description file CONTAM.DES for explanation of codes (table 15).
CLASS	1	Code assigned by the Kansas Department of Health and Environment identifying class of site.
COMPLET_DATE	6	Date well construction was completed (YYMMDD).

Table 2. *Description and format of header (HED) files*--Continued

Item name	Number of columns in item	Item description
LICENSE_NO	4	Code identifying company or agency that drilled the well; see code-description file LICENS.DES for explanation of codes (table 15). Numeric codes are license numbers assigned to well-drilling contractors by the Kansas Department of Health and Environment.
INACT_DATE	6	Date the site became inactive (YYMMDD).
STATUS	1	Code for status of site. See code-description file STATUS.DES for explanation of codes (table 15).
CASING	1	Code for availability of well-casing information for site; Y=yes, N=no. The information is in data-set files with CAS suffix (table 3).
GROUT	1	Code for availability of grouting information for site; Y=yes, N=no. The information is in data-set files with GRT suffix (table 4).
SCREEN	1	Code for availability of well-screen information for site; Y=yes, N=no. The information is in data-set files with SCR suffix (table 5).
LITHOLOGY	1	Code for availability of lithologic information for site; Y=yes, N=no. The information is in data-set files with LTH suffix (table 6).
AQUIFER	1	Code for availability of information about the aquifer that is the primary source of water to well; Y=yes, N=no. The information is in data-set file with AQF suffix (table 7).
GWL	1	Code for availability of information about depths at which water was encountered during drilling at site; Y=yes, N=no. The information is in data-set file with GWL suffix (table 8).
RWL	1	Code for availability of water-level information (other than static water level measured at time of well completion) at site; Y=yes, N=no. The information is in data-set file with RWL suffix (table 9).
WATER_QUALITY	1	Code for availability of water-quality information for site; Y=yes, N=no. The information is in data-set files with SAM and CON suffixes (tables 10 and 11, respectively).
WITHDRAWAL	1	Code for availability of water-withdrawal information for site; Y=yes, N=no. The information is in data-set file with WUD suffix (table 12).
REMARKS	80	Miscellaneous information about the site.

The part of the site location contained in the item TWP_RNG_SEC uses the same definition for all three systems. The information contained in the item QUALIFIERS identifies where the site is located within the section defined in TWP_RNG_SEC; each of the three systems defines this location differently. Table 2 contains descriptions of items in the files with the HED suffix, including a more detailed description of the three location systems. Figure 6 shows how a site's location would be defined in each of the three systems used in the files with the HED suffix.

The files ending with CAS, GRT, or SCR contain well-construction data for the sites that are wells. The files with the CAS suffix contain data about the well casing. The files with the GRT suffix contain data about the grouting of the well. The files with the SCR suffix contain data about well screens in the well. Tables 3, 4, and 5 contain descriptions of the items in the files with the CAS, GRT, and SCR suffixes, respectively.

The files with the LTH or AQF suffixes contain geologic data about the sites that are wells. Data about the different lithologies encountered in the well are contained in the files with the LTH suffix. The file with the AQF suffix contains data about the aquifer that is the primary source of water to the well. Tables 6 and 7 contain descriptions of the items in the files ending with the LTH and AQF suffixes, respectively.

The files ending with GWL or RWL contain water-level data for the sites that are wells. Data about the different depths at which water was encountered during drilling are in the file with the GWL suffix. The file with the RWL suffix contains data about the water levels measured in the wells at different times after the wells were completed. Tables 8 and 9 contain descriptions of the items in the files with the GWL and RWL suffixes, respectively.

The files ending with SAM or CON contain data about the quality of water at the site. The files with the SAM suffix contain data about the date and time the water-quality sample was collected. The files with the CON suffix contain data about the results of the constituent measurements or analyses performed on water samples collected from the site. Tables 10 and 11 contain descriptions of the items in the files with the SAM and CON suffixes, respectively.

The file with the WUD suffix contains data about the volume of water withdrawn in 1990 at sites where water diversions are permitted by *DWR*. Table 12 contains descriptions of the items in the file ending with the WUD suffix.

The files with the NAR and ATT suffixes contain information documenting the data sets and the items in the data sets. The files ending with NAR contain a narrative description of the data set. The files ending with ATT contain a brief documentation for each data-set file and for each item in each of the files. Tables 13 and 14 contain descriptions of the items in the files with the NAR and ATT suffixes, respectively.

Explanation Files

The files with the DES suffix are explanation files and are used by all the data sets. All files with the DES suffix contain definitions of codes used for some of the items in the data-set files; the three- to six-letter root of the names of the files ending with DES is an abbreviation of the item name or for the part of the item that contains the code in the data-set files. Tables 2-14 explain the purpose of each coded item and refer the reader to the proper file with the DES suffix. The files ending with DES contain each individual code and its explanation. All DES files contain the same two items, CODE and DESCRIPTION, but the format of each is different and is described in table 15.

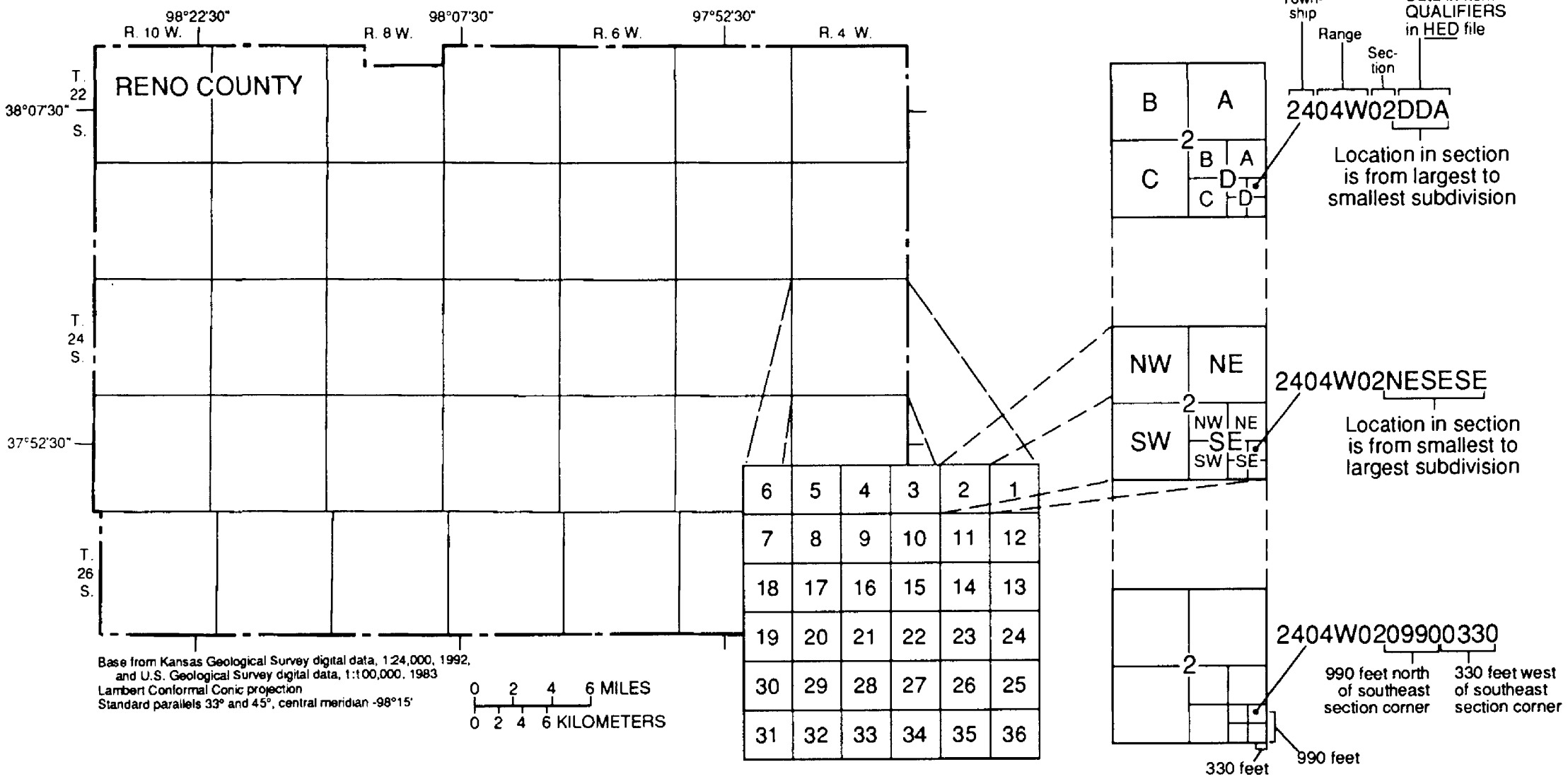


Figure 6. Site-location systems used in data sets.

Table 3. *Description and format of well-casing (CAS) files*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
CASING_TYPE	2	Code for material from which the well casing is made; see code-description file CASTYP.DES for explanation of codes (table 15).
CASING_DIAMETER1	2	Diameter of the first length of well casing, in inches.
CASING_FEET1	4	Length of well casing with a diameter equal to CASING_DIAMETER1, in feet.
CASING_DIAMETER2	2	Diameter of the second length of well casing, in inches.
CASING_FEET2	4	Length of well casing with a diameter equal to CASING_DIAMETER2, in feet.
CASING_DIAMETER3	2	Diameter of the third length of well casing, in inches.
CASING_FEET3	4	Length of well casing with a diameter equal to CASING_DIAMETER3, in feet.

Table 4. *Description and format of grouting (GRT) files*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
GROUT_TYPE1	1	Code for material from which first type of grout used is made; see code-description file GRTTYP.DES for explanation of codes (table 15).
GROUT_TYPE2	1	Code for material from which second type of grout used is made; see code-description file GRTTYP.DES for explanation of codes (table 15).
GROUT_FROM_FT1	4	Depth to top of first grouted interval, in feet below land surface.
GROUT_TO_FT1	4	Depth to bottom of first grouted interval, in feet below land surface.
GROUT_FROM_FT2	4	Depth to top of second grouted interval, in feet below land surface.
GROUT_TO_FT2	4	Depth to bottom of second grouted interval, in feet below land surface.
GROUT_FROM_FT3	4	Depth to top of third grouted interval, in feet below land surface.
GROUT_TO_FT3	4	Depth to bottom of third grouted interval, in feet below land surface.

Table 5. *Description and format of well-screen (SCR) files*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
SCREEN_TYPE	2	Code for material from which the well screen is made; see code-description file SCRTYP.DES for explanation of codes (table 15).
SCREEN_OPENING	2	Code for type of openings in well screen; see code-description file SCROP.DES for explanation of codes (table 15).
SCREEN_FROM_FT1	4	Depth to top of first screened interval, in feet below land surface.
SCREEN_TO_FT1	4	Depth to bottom of first screened interval, in feet below land surface.
SCREEN_FROM_FT2	4	Depth to top of second screened interval, in feet below land surface.
SCREEN_TO_FT2	4	Depth to bottom of second screened interval, in feet below land surface.
SCREEN_FROM_FT3	4	Depth to top of third screened interval, in feet below land surface.
SCREEN_TO_FT3	4	Depth to bottom of third screened interval, in feet below land surface.
SCREEN_FROM_FT4	4	Depth to top of fourth screened interval, in feet below land surface.
SCREEN_TO_FT4	4	Depth to bottom of fourth screened interval, in feet below land surface.

Table 6. *Description and format of lithology (LTH) files*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
SEQUENCE_NO	1	Sequence number, which distinguishes multiple records for the same site when combined with ORIG_ID. Each site can have up to 27 lithologies (3 records) identified.
LITH_DEPTH1	4	Depth to bottom of first lithology encountered during drilling, in feet below land surface.
LITH_CODE1	2	Code for first lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH2	4	Depth to bottom of second lithology encountered during drilling, in feet below land surface.
LITH_CODE2	2	Code for second lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH3	4	Depth to bottom of third lithology encountered during drilling, in feet below land surface.
LITH_CODE3	2	Code for third lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH4	4	Depth to bottom of fourth lithology encountered during drilling, in feet below land surface.
LITH_CODE4	2	Code for fourth lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH5	4	Depth to bottom of fifth lithology encountered during drilling, in feet below land surface.

Table 6. *Description and format of lithology (LTH) files*--Continued

Item name	Number of columns in item	Item description
LITH_CODE5	2	Code for fifth lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH6	4	Depth to bottom of sixth lithology encountered during drilling, in feet below land surface.
LITH_CODE6	2	Code for sixth lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH7	4	Depth to bottom of seventh lithology encountered during drilling, in feet below land surface.
LITH_CODE7	2	Code for seventh lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH8	4	Depth to bottom of eighth lithology encountered during drilling, in feet below land surface.
LITH_CODE8	2	Code for eighth lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).
LITH_DEPTH9	4	Depth to bottom of ninth lithology encountered during drilling, in feet below land surface.
LITH_CODE9	2	Code for ninth lithology encountered during drilling; see code-description file LTHCOD.DES for explanation of codes (table 15).

Table 7. *Description and format of aquifer-identification (AQF) file*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
AQUIFER	8	Code for aquifer that is the primary source of water at the site; see code-description file AQUIFR.DES for explanation of codes (table 15).

Table 8. *Description and format of ground-water-level (GWL) file*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
DEPTH_GW1	4	Depth at which ground water was encountered for the first time during drilling, in feet below land surface.
DEPTH_GW2	4	Depth at which ground water was encountered for the second time during drilling, in feet below land surface.
DEPTH_GW3	4	Depth at which ground water was encountered for the third time during drilling, in feet below land surface.
WATER_DEPTH	4	Depth to water at site, in feet below land surface.

Table 9. *Description and format of recurring water-level (RWL) file*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
WATER_LEVEL_DATE	8	Date depth to water was measured (YYYYMMDD).
WATER_LEVEL	7	Depth to water, in feet below land surface.
RWL_STATUS	1	Code for status of site at time depth to water was measured; see code-description file RWLSTA.DES for explanation of codes (table 15).
RWL_METHOD	1	Code for method used to measure depth to water; see code-description file RWLMTH.DES for explanation of codes (table 15).

Table 10. *Description and format of sample-information (SAM) files*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
SAMPLE_NO	9	Unique number assigned to samples collected from a site at a particular time on a particular day. This number is used to cross reference analysis results in the CON files (table 11) in this data set. This number cannot be used to cross reference analysis results in CON files contained in other data sets.
DATE	8	Date sample collected (YYYYMMDD).
TIME	4	Time sample was collected (in 24-hour clock time).

Table 11. *Description and format of water-quality-constituent (CON) files*

Item name	Number of columns in item	Item description
SAMPLE_NO	9	Unique number assigned to each sample collected from a site at a particular time on a particular day. This number is used to cross reference sample data in the SAM files (table 10) in this data set. This number cannot be used to cross reference sample data in SAM files in other data sets.
PARM_CODE	5	Code used for constituent name, reporting units, and method of analysis; see code-description file PARCOD.DES for explanation of codes (table 15). Where possible, the U.S. Environmental Protection Agency's five-digit storage and retrieval system (*STORET*) codes were assigned.
VALUE	12	Value of constituent, in units defined by PARM_CODE.
REMARK	1	Code for remarks about VALUE; see code-description file REMARK.DES for explanation of codes (table 15).

Table 12. *Description and format of water-withdrawal (WUD) file*

Item name	Number of columns in item	Item description
ORIG_ID	5	Unique number assigned to each site in this data set. The number is used to cross reference each site in this file to information about the same site in other files contained in this data set. This number cannot be used to cross reference sites in files in other data sets.
REPORT_YEAR	4	Reporting year for METERED_QUANTITY and PUMP_RATE (YYYY).
HOURS_PUMPED	4	Reported number of hours the site was pumped during the reporting year. Used with PUMP_RATE to calculate the volume of water used (GWU).
PUMP_RATE	4	Reported rate of pumpage for the site, in gallons per minute.
METERED_QUANTITY	8	Reported quantity of water pumped during the year, in gallons per minute. Quantity is measured by a meter at the site.
GWU	14	Gallons of water pumped at the site during the reporting year. If METERED_QUANTITY is zero, calculations are made by the Division of Water Resources of the Kansas State Board of Agriculture based on some combination of HOURS_PUMPED, PUMP_RATE, tested rate of the pump, or the quantity of water the site is authorized to pump.
GWI	1	Code for method used to calculate GWU; see code-description file GWI.DES for explanation of codes (table 15).
REPORT_CODE	1	Code for types of data reported; see code-description file REPCOD.DES for explanation of codes (table 15).
ACRES_IRR	4	Number of acres irrigated by water pumped from the site.

Table 13. *Description and format of narrative-description (NAR) files*

Item name	Number of columns in item	Item description
TXT_NARR	80	Narrative-style records describing the data set and explanation files. The description includes sections for each of the following: abstract, keywords, applications that use the data-set data, the intended use of the data, limitations of the data, discussion of attributes, procedures used to create or automate the data, revisions made to the data, reviews applied to the data, related tabular data sets and programs, references cited, and notes.

Table 14. *Description and format of attribute-description (ATT) files*

Item name	Number of columns in item	Item description
TYPE	6	Type of data described in this record. If TYPE is TABLE, the type of data described in this record is a data-set file; if TYPE is COLUMN, the type of data described in this record is an item in a data-set file.
FILENAME	32	Name of data-set file.
ITEMNAME	16	Name of item in data-set file; will be blank if TYPE is TABLE for this record.
ITEMWIDTH	4	Width (number of columns) of the item; will be blank if TYPE is TABLE for this record.
ITEMTYPE	1	Code for representation used to store the item values by the computer; will be blank if TYPE is TABLE for this record. See code-description file ITMTYP.DES for explanation of codes (table 15).
NUMDECIMAL	2	Number of places to the right of the decimal point; will be blank if TYPE is TABLE for this record.
SHORTDEF	80	Short definition of data stored in data-set file or in item.
DATADOMAIN	80	Type or range of values expected if TYPE is COLUMN for this record; will be blank if TYPE is TABLE for this record.
DATASOURCE	80	Source of data in the data-set file or item.
ATTACCURACY	80	Accuracy of item; will be blank if TYPE is TABLE for this record.

Table 15. *Description and format of code-description (DES) files*

DES files					Data-set files	
File name	Contains description of codes for	Number of columns in item CODE	Number of columns in item DES-CRIP-TION	Number of records in file	Item containing code	Suffix of file con-taining coded item
ALIBEG.DES	Use of site	2	40	23	ADDRESS	HED
AQUIFR.DES	Aquifer name	8	115	25	AQUIFER	AQF
CASTYP.DES	Well-casing material	2	40	22	CASING_TYPE	CAS
CONTAM.DES	Site's nearest potential source of contamination	2	40	16	CONTAM_TYPE	HED
GRTTYP.DES	Grouting material	2	40	9	GROUT_TYPE1-2	GRT
GWI.DES	Method used to calculate quantity of water withdrawn	1	160	4	GWI	WUD
ITMTYP.DES	Representation of items stored	1	80	6	ITEMTYPE	ATT
LICENS.DES	Company or agency that drilled well	4	144	199	LICENSE_NO	HED
LTHCOD.DES	Lithology	2	60	36	LITH_CODE1-9	LTH
PARCOD.DES	Water-quality constituent	5	80	340	PARM_CODE	CON
PLACC.DES	Accuracy of site location	1	80	12	PLACE_ACCURACY	HED
QUALFR.DES	Location of site in section	2	40	17	QUALIFIERS	HED

Table 15. *Description and format of code-description (DES) files*--Continued

DES files					Data-set files	
File name	Contains description of codes for	Number of columns in item CODE	Number of columns in item DES-CRIP-TION	Number of records in file	Item containing code	Suffix of file con-taining coded item
REMARK.DES	Remark about value of water-quality constituent	1	80	8	REMARK	CON
REPCOD.DES	Type of data reported	1	80	4	REPORT_CODE	WUD
RWLMTH.DES	Method used to measure depth to water	1	40	14	RWL_METHOD	RWL
RWLSTA.DES	Site status at time of water-level measurement	1	80	17	RWL_STATUS	RWL
SCROP.DES	Type of well-screen openings	2	40	21	SCREEN_OPENING	SCR
SCRTYP.DES	Well-screen material	2	40	22	SCREEN_TYPE	SCR
SITYPE.DES	Type of site	1	20	23	SITE_TYPE	HED
STATUS.DES	Status of site	1	40	8	STATUS	HED
WATUSE.DES	Use of water	2	40	45	WATER_USE	HED

SUMMARY

Water-resource-related data for sites in Reno County were compiled in cooperation with the Reno County Health Department as part of the *KDHE*'s *LEPP*. These data were entered into a *RDBMS* to facilitate the analysis required to meet the *LEPP* goals of developing plans for nonpoint-source management and for public-water-supply protection. The data in the *RDBMS* are organized into digital data sets. The data set **RNUSGS** contains site, construction, geologic, water-level, and water-quality data compiled by the *USGS* for 958 wells. The data set **RNWWC5** contains site, construction, and geologic data compiled by the *KDHE* for 3,936 wells. The data set **RNHEQW** contains site and water-quality data compiled by the *KDHE* for 51 wells, 18 public-water-supply distribution systems, and 7 streams. The data set **RNDWR** contains site and water-withdrawal data compiled by the *DWR* for 643 wells and 23 streams or surface-water impoundments. The data set **RNDRLG** contains site, construction, and geologic data compiled by well-drilling contractors and the *KGS* for 96 wells. The data in these five data sets are available from the Reno County Health Department in Hutchinson, Kansas.

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