NATIONAL WATER DATA STORAGE AND RETRIEVAL SYSTEM

• Instructions for preparation and submission of ground-water data

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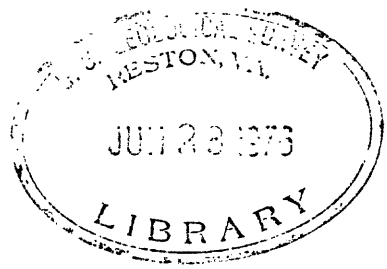
By Claud H. Baker, Jr. (USGS) and Donald G. Foulk (CACI, Inc.)



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INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

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INTRODUCTION

The Ground-Water File of the Geological Survey's National Water Data Storage and Retrieval System (WATSTORE) contains physical, hydrologic and geologic data about sites where ground water is, or can be, withdrawn from the aquifer, or sites where potential aquifers are exposed. Most such sites are wells, but test holes, springs, tunnels, drains, ponds, other excavations, and outcrops are also included, in addition to specialized types of wells such as well groups and collector wells.

This report, which pertains to the preparation and submission of data to the ground-water file, is the first of several reports that will explain the ground-water file. Eventually, these reports will be incorporated as Volume 2 of the WATSTORE User's Guide. The present report is designated to be Chapter II of Volume 2 and has been prepared in the format of the User's Guide.

Chapter II is divided into four sections. Section A gives a brief description of the data bases, their logical and physical structure, the storage and retrieval mechanisms used, and the philosophy and methodology adopted for their maintenance. Section B describes the input forms, and gives detailed instructions for entering data on the forms in the field or office. Section C deals with the special input procedures and Section D gives instructions for key punching and processing data for input to the data bases. Concluding the chapter are five appendices that contain sample forms and codes used in recording ground-water data and a discussion of input procedures.

Donald G. Foulk, CACI, Inc., Arlington, Virginia, co-author of this report, worked under contract with the U. S. Geological Survey in integrating the ground-water data bases with a generalized Data Base Management System called SYSTEM 2000.

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

SECTION II.A. System Overview

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

II.A. System Overview

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SECTION II.A. SYSTEM OVERVIEW

DATA BASE DESCRIPTION

The ground-water file is designed to provide a national repository for data from sites where ground water has been, is, or can be withdrawn. These data then would be readily available and easily accessible for future hydrologic studies. Towards this objective the Water Resources Division of the U. S. Geological Survey has established and maintains a number of data bases for the storing of data collected either by Federal or local organizations active in the field of water resources.

The data bases, as currently defined, contain the following categories of data:

Site identification
Site location
Site description
Ownership history
Other Agency Identification
Site visit history
Field visit water quality test results
Site construction data
    Hole dimensions
    Casing descriptions
    Opening descriptions
Production data (flowing or pumped)
Lift data
    Major pump data
    Standby power capability
Availability of additional data
Availability of logs
Water quality collection, periods of
Water level measurement, periods of
Water withdrawal measurement, periods of
Geohydrologic unit descriptions
    Aquifer contribution
Cooperator data
Hydraulic test results
Pertinent remarks
Water level data
Miscellaneous values

Forms used in recording these data are shown in Appendix A, and each form is discussed in detail in Section B. Each data element and certain data elements that are automatically generated by the input processing system are listed in Appendix B. A careful perusal of these appendices will provide a greater understanding of the content of the data bases.

DATA BASE STRUCTURE

The ground-water data are managed and maintained through a generalized Data Base Management System called SYSTEM 2000. The logical organization of a SYSTEM 2000 data base is an hierarchical structure, with inverted lists or indexes. All the data about a single major item (in this case, a well, spring, or other site) comprises a logical entry in the data base.

Individual pieces of information, such as the altitude of the site or the temperature of the water are data elements; logically related data elements are grouped into blocks called repeating groups.

Under the concept of the hierarchical structure, every data element "belongs to" a repeating group, and every repeating group "belongs to" a higher-level repeating group (the logical entry is, itself, a repeating group at the highest level, belonging to the data base). Thus, information about the casings in a well "belongs to" the set of information about the well's construction; the construction information "belongs to" the well; and the well, the logical entry, is a repeating group belonging, in turn, to the data base as a whole.

A fundamental aspect of the repeating group is that it can occur once, many times, or not at all. Each logical entry "contains" all the information about an individual site, and because the logical entry is a repeating group that can occur many times, there can be information about many sites in the file. Similarly, for any particular logical entry (site) there can be data on several owners. Each OWNER repeating group contains the necessary information of a particular ownership and because ownership can change over time, more than one occurrence of the repeating group can be assigned to a site.

GROUND-WATER DATA BASES

The volume of ground-water data which is available is well beyond the current cost-to-benefit feasibility to maintain it all on on-line computer storage devices. However, it is very important that all the data be available for ready and easy access. Accordingly, ground-water data have been subdivided (based on estimated highest benefit-to-cost) into several distinct data files or "data bases". Certain data, such as Water Quality, will continue to be reported and maintained as documented in Volume 1 of the WATSTORE User's Guide (U.S. Geological Survey Open-File Report 75-426).

Two SYSTEM 2000 data bases have been established for the storage of site inventory and water levels data for ground-water sites. Submission of data for these data bases is addressed in this manual. Subsequent manuals will address the retrieval of data from these data bases and methods of interfacing these two data bases with each other and the various other WATSTORE data files.

GROUND-WATER SITE INVENTORY (GWSI)

Figure 1 identifies the various repeating groups which have been defined for this data base. They are arranged in a logical tree structure

representing their hierarchical relationships to each other. That is, all those repeating groups, defined by boxes, which appear below the box labeled "Site" are groups of related data elements directly related to the description of the site. According to the individual site any one of these so called lower-level repeating groups may occur once; several times, or not at all. The absence of a repeating group may be the result of the lack of data or applicability to that particular site. For example, the repeating group labeled "Springs" would not be appropriate with a site whose type was identified "Well."

An important aspect of the system is that logical entries can be of varying length, since, if a repeating group is not required, it is not stored and no space is reserved for it. If information that belongs in a non-existent repeating group is added later, the repeating group is created and stored in any available space, with pointers being automatically established to relate it back to the correct logical entry or parent.

GROUND-WATER LEVELS DATA BASE (GWLD)

Figure 2 depicts the structure of the WATER LEVELS data base. It is important to note the following points:

- All data are entered through a single GROUND-WATER input system, however, water-level data are stored in this data base.
- The data base is segmented into separate sections for each district or reporting agency.
- The data are maintained off-line, that is, on magnetic tape.
- The site repeating group depicted at Level 0 contains only the 15 digit unique identification number of the site to which the measurements apply.

DATA ELEMENT FORMATS

Five types of data elements are stored in the ground-water data bases. The data types and their definitions are:

NAME	Alphanumeric data (any character recognized by the machine) with all leading and redundant internal blanks removed by the system. Single blanks between words or other syntactic units are retained; but if more than one blank occurs between words, the extra blanks are removed.
TEXT	Alphanumeric data with leading blanks and redundant internal blanks retained. Only two components in the ground-water data base (local number and remarks) are defined as type TEXT.
INTEGER	Integer numbers; that is, numbers with no decimal point or fractional part.

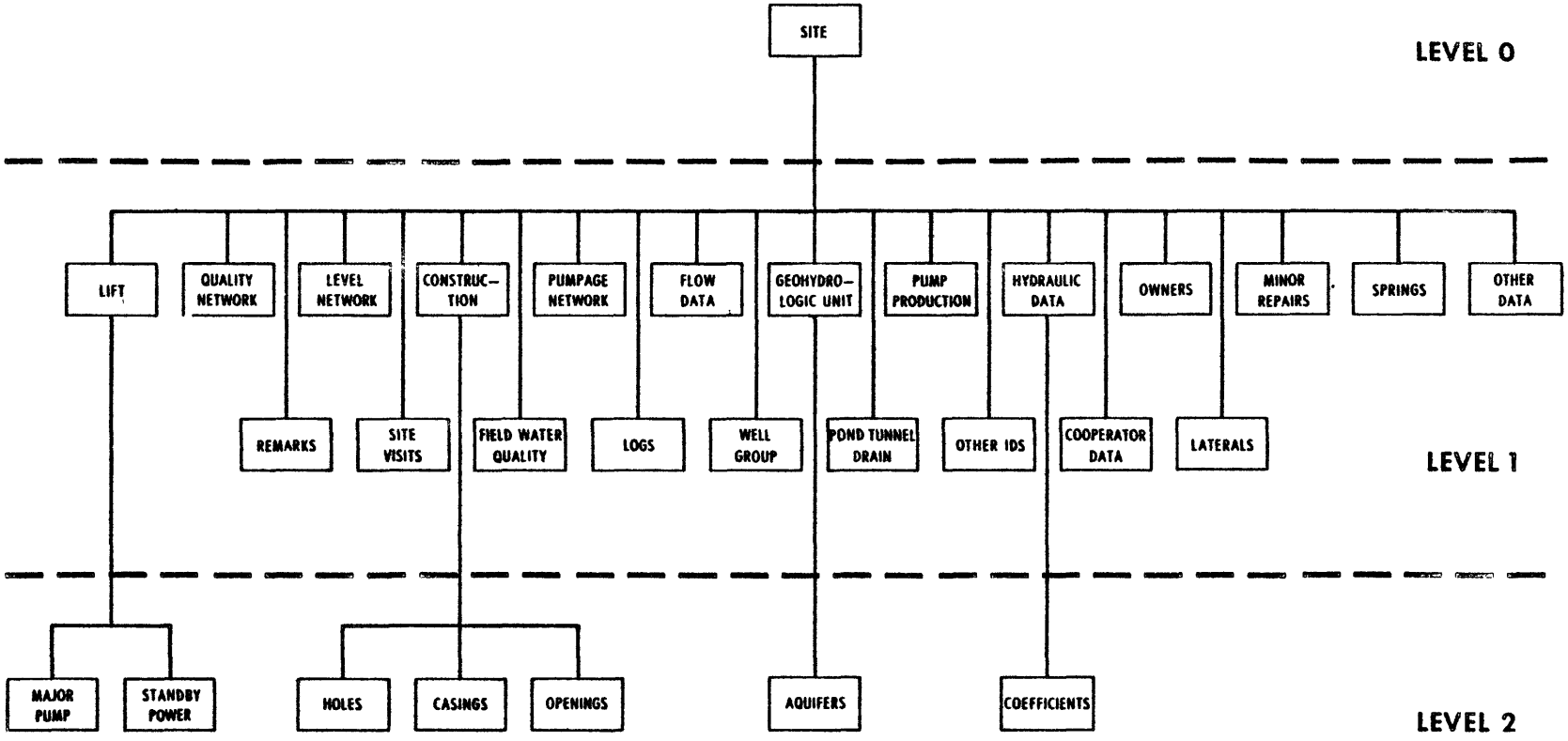

FIGURE 1: Hierarchical Structure of the GWSI Data Base

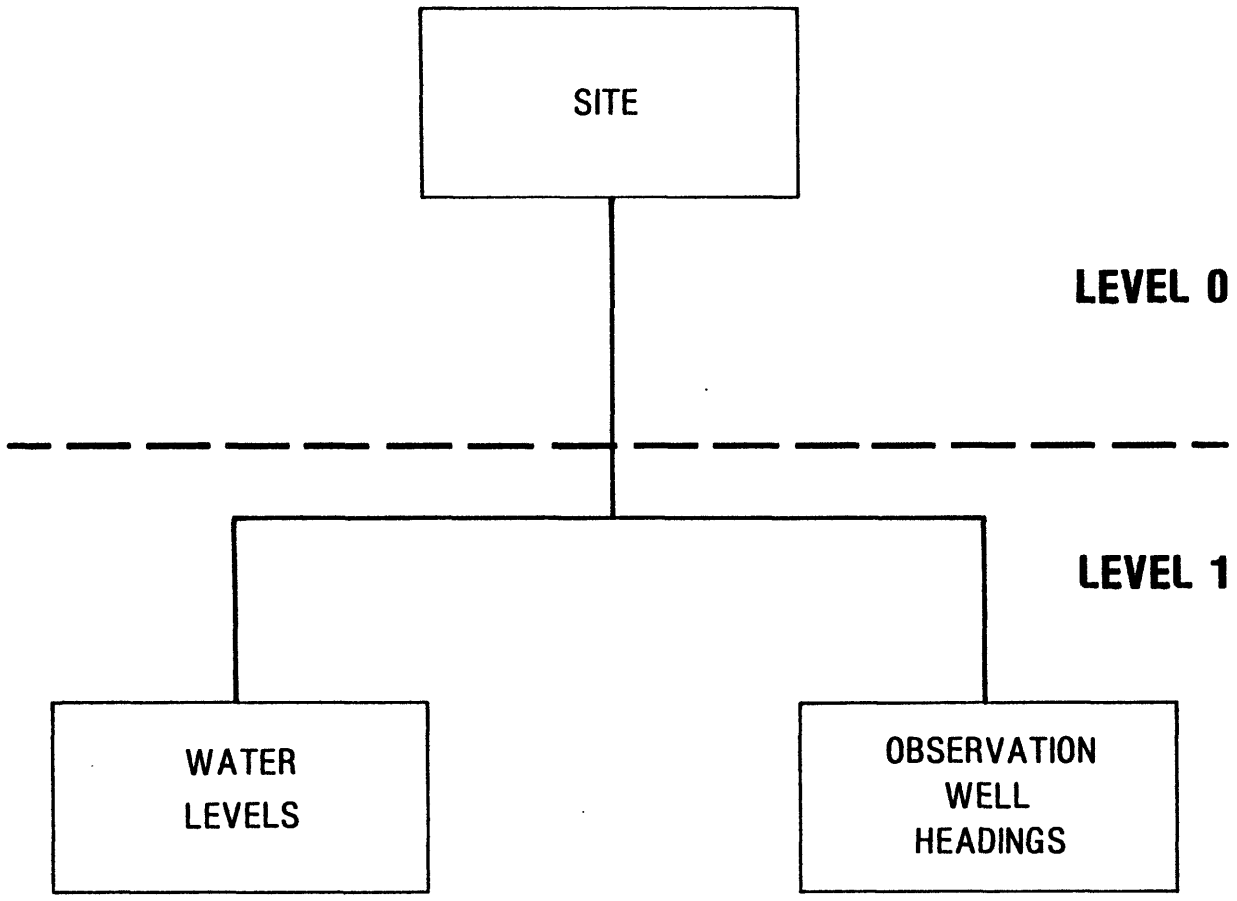

FIGURE 2: Hierarchial structure of the GWLD Data Base

DECIMAL Decimal numbers; that is, numbers that include a decimal point and a fractional part. Decimal numbers must always be recorded with a decimal point.

DATE A fixed-format field of the form MM/DD/YYYY standing for month, day, and year. Month and day must be two digits (use leading zeros if needed) and must be a valid date since the advent of the Gregorian Calendar (October 15, 1582).

The field length for data elements of types INTEGER, DECIMAL, and DATE are fixed by the definition, and values larger than the space allowed in these forms will be rejected. For data of types NAME and TEXT, however, the system allows for entries longer than specified field length, if the specified field length is 4 or more characters. When a string of characters longer than the specified field size is entered as the value of a NAME or TEXT data element, excess characters are stored elsewhere in the data base and a pointer to these extra characters is stored in place of the value. This feature, called overflow, can be very valuable for occasional use, but overuse of the feature degrades system performance by requiring extra accesses to the data base to retrieve the overflow values.

DATA RETRIEVAL

Inverted lists or indexes are constructed by the system to facilitate retrieval of data based on the values of key data elements; such as "list all sites where the primary water-use is for livestock." A table is constructed for each key element (for example, water-use) listing each unique value for that element, the number of logical entries (sites) that contain that value, and the direct data-storage addresses of those logical entries containing the unique value. Some key elements have many unique values but only a few occurrences per unique value; for example, site identification has only one occurrence per unique value (records with duplicate site identifications will not be stored in the data base). Other key elements such as district code, will have only a few unique values, but many occurrences of each value.

This "indexing" allows rapid retrieval of selected logical entries, with a minimum number of accesses to the main body of data. Certain statistical information about key elements, such as the number of logical entries that contain a given value or the range of unique values for a given key element are determined from the inverted lists, and can be obtained without access to the main body of data.

DATA INPUT PHILOSOPHY

The most important aspect of any data system is the input process, for if the procedure is not easy, economical and accurate, the system

will not be used. The overriding consideration, however, is the accuracy element. That is, if the user of the data, the individual who will use the data in support of his hydrologic projects, does not have confidence in the validity of the data, he will not use the system. If the system is unused, its cost of maintenance can not be justified.

Recognizing the importance placed in data validity, WRD has attempted to develop a system which makes every effort to ensure the correctness of the data. However, an automated system can only evaluate the reasonableness of data submitted, only the data collector can verify the true validity of the data. For instance, the computer system can check that the code entered for Water-Use is one of the list of legal water usage codes and can insure that the specified altitude is within the range of altitudes possible for the state in which the site is located. However, it can not insure that the code submitted or the altitude reported are valid. For example, if the minimum and maximum altitudes for state X are specified as 10 feet and 3521 feet, respectively, and an altitude of 402.9 is reported, the computer system must accept the value as correct, even though the true value is 40.29 feet.

For the above reasons it is mandatory, in order to insure the collection of valid and correct data, that the data collector not only enter the data, but verify that what was intended to be entered into the data base was entered. This is not to imply he must remeasure the altitude, but rather that he should insure that what was reported to or collected by him was what was entered into the system without mistranscription.

DESCRIPTION OF GROUND-WATER INPUT SYSTEM

Figure 3 is a schematic depicting the structure of the computer system established to process input to the ground-water data bases. The system handles both site inventory and water levels and consists of four related computer programs:

GW Edit - checks each input transaction for structural correctness, edits each data element for legality or reasonableness of value, compares related data elements with values already in the GWSI data base (Note: The GWLD data base is not accessed by the edit) for consistency. Illegal, unreasonable, and inconsistent values are rejected. Doubtful or possible inconsistent values are flagged to the user for verification, but are accepted as good. Valid or "clean" values are passed to the appropriate updates (as will be discussed later, this is under the direct control of the GW Data Base Administrator (DBA) only); that is, site inventory data is passed to the GWSI update and water levels data to the GWLD update.

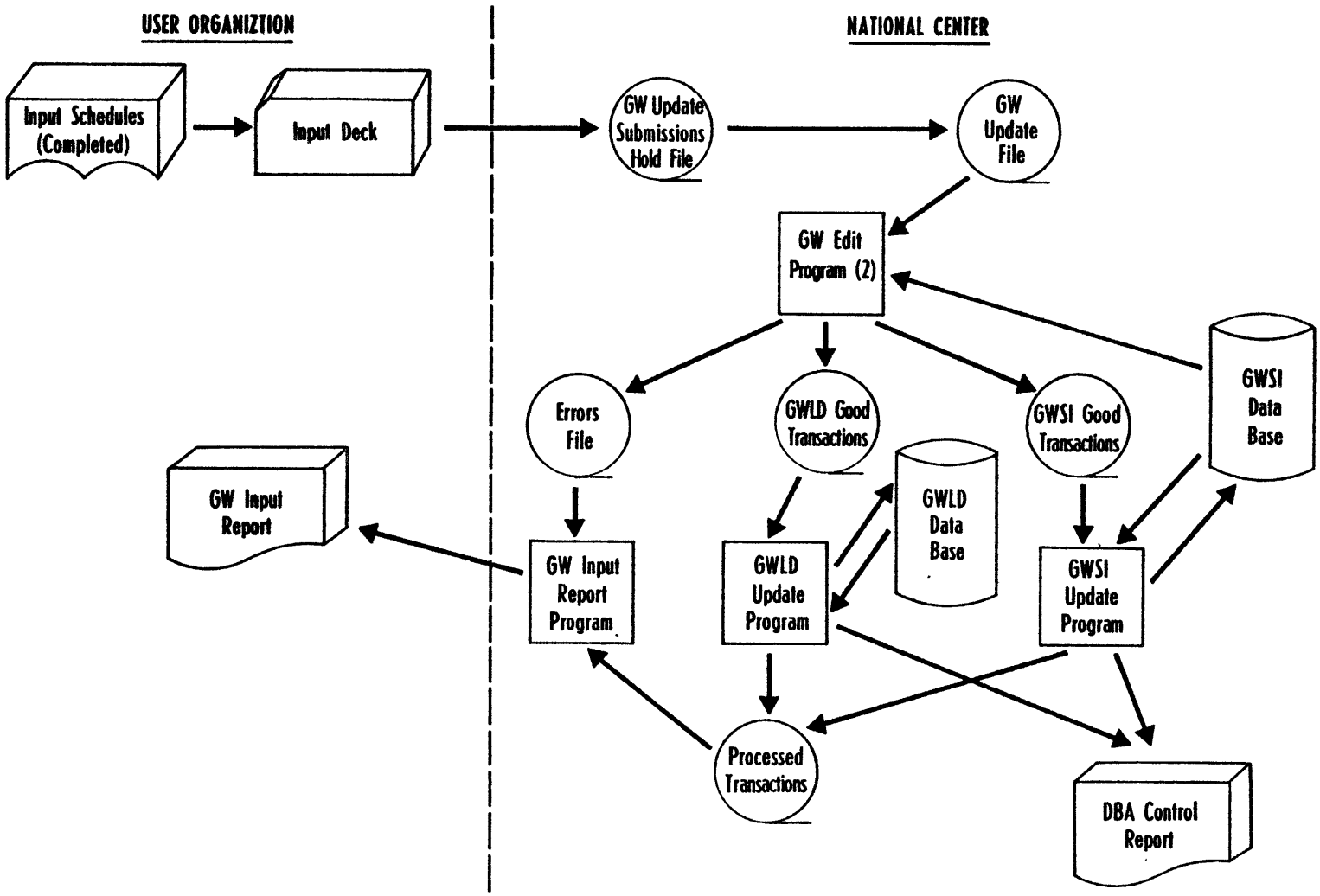

FIGURE 3: Schematic of the GROUND WATER data base input system.

[1/] GWSI Update — Clean site inventory data transactions are used to physically modify the GWSI data base. All correctly completed updates are passed to the GW Report program for possible delay.

[1/] GWLD Update — Clean water levels data transactions are used to physically modify the GWLD data base. All correctly completed updates are passed to the GW Report program for possible delay.

GW Report — The errors (or warnings) detected by the edit are displayed for the user by this program. This program will also print a playback of the input transactions as submitted and a playback of the modifications made to the data base upon request.

DESCRIPTION OF THE INPUT REPORT

Appendix C is an example of the input report. The report is divided into three parts, and the first and second parts, in turn, are each divided into two sections. Section 1 of Part 1 of the report contains either a complete listing of all the submitted data transaction card images or only those found to have syntactic errors, based on the user's request. Along with each appropriate card image are messages produced by the initial scanning of cards during the edit. The second section of Part 1 of the report is an error code directory. It consists of a sequential listing of each error encountered and provides a concise description of the cause and effect of the error.

The first section of Part 2 of the report lists all those errors or possible errors encountered during the edit of the submitted transactions. The edit diagnostic messages may or may not occur in the same sequence in which the data were submitted, since it is necessary for the edit to sort all transactions into a prescribed order to facilitate proper processing. To enable proper associations between input card and error, the card number of the first card defining the transaction is printed in the rightmost column of each diagnostic message. The second section, as in Part 1, is a directory of all the error codes generated during the edit.

Part 3 is optionally produced at the request of the user. It is a playback of those actions effected upon the data base as a result of the update. The number, name and value, are displayed for each data element, (whether itself modified, or not) of each created or modified repeating group. In addition, completed deletes and verifications are also reported. Fields with no value have '**NULL**' displayed for their value. This part

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[1/] The GWSI and GWLD update programs can only be activated by the Ground-Water Data Base Administrator (GW/DBA). This restriction has been imposed to safeguard the integrity of the data base.

of the input report provides the user with a complete audit trail of an update's effect upon the data base. The output should be carefully reviewed to verify that: 1) all actions intended were accomplished, 2) all intended actions were processed correctly, and 3) by-product actions were not inadvertently effected.

OPERATION OF THE INPUT SYSTEM

Control of the GW data input system is a split function. It is the responsibility of the participating organizations (Survey district office, state cooperators, and so forth), hereafter referred to as the user, to collect and prepare the data for submission. Once prepared, the data are forwarded to the GW Data Base Administrator (GW/DBA), located at the National Center; he will control the final edit and update process.

The user is given the option and capability to execute preliminary edits. The pre-edit performs all the functions of the final edit, except for the creation of the Good Transaction file (see Figure 3). The GW/DBA only can perform the final edit. It is strongly recommended that the user take advantage of the pre-edit. This provides an opportunity to purge or correct detected errors prior to the data's submission for update processing. In this way the user can be more confident that the data finally submitted will be completely processed as intended. This procedure will insure a more timely data base. Errors detected during the scheduled update process will be rejected, and their correction can not be processed until the following scheduled update.

The denial of the update capability to the user results from the following concerns:

1. Many organizations will be using the GW system. Protection must be afforded against one user modifying or deleting (inadvertently or intentionally) another's data.
2. The data base will grow rapidly in size and use over the first few years. Time and cost to re-establish it in the event of damage will become increasingly intolerable. Procedures are therefore required to protect it from damage.

Predicated on the first consideration, complete control of the data base has been placed under the GW Data Base Administrator. He, and only he, can effect the update of the data base. He will ensure that only the organization that originally established a site in the data base will be able to update it. He shall also make all other decisions regarding the content and structure of the data bases and all questions or requests should be directed to him.

With regard to the second concern, there are only two basic means by which the data bases can be damaged or made unavailable to the user, necessitating re-establishment. The first is through a failure causing physical damage to the storage device upon which the data base is stored, for example, a disk head crash. This type of failure can not be avoided; the only protection is to make periodic backup copies of the data base so that is can be re-established to a point in time.

Aside from physical damage, the other way in which the data bases can be damaged is for the computer system to fail or for a software error to occur during an update step. That is, a single SYSTEM 2000 update action such as the modification of one field's value may in effect cause several changes in the data base. For instance, if the water use code for site X is changed, not only must the data value be changed but so must the inverted list maintained for water use. Water use is a key field or retrieval field. When its value changes the pointer to the data record must be removed from the list for the old value and added to the list of the new value. If it is a new value, a new list must be established. The data base's integrity is questionable if either the computer system or the software program fails before all these actions are completed. SYSTEM 2000 assumes the data base is damaged if it does. In this situation SYSTEM 2000 will permit continued data retrieval but no further updating can be performed until the data base is re-established.

In order to protect against this possibility, the input system has been designed to minimize the elapsed update time during which the data base is vulnerable. The GW/DBA will select the time for updates, and monitor and control the process to further reduce the risk.

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

SECTION II.B. Coding Data for the System

II.B. Coding Data for the System

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SECTION II.B. CODING DATA FOR THE SYSTEM

INTRODUCTION

The forms* for recording data have been designed for use as both a field record sheet and key-punching input form. Space is provided at the top of each form for the name of the person filling (or entering data on) the form and the date on which this was done. Space is also provided for indicating by a checkmark whether the data are recorded in English or SI (metric) units. At present, all data are to be recorded in English units. We expect the U. S. to convert to metrics; during the transition period, we must know whether data already coded but not stored are in English or SI units. Therefore, the space for units must always be checked, even though English units are to be used exclusively until further notice.

Before describing the individual input schedules, it is first necessary for the data collector to understand certain general concepts embodied in their design. Specifically:

- Value Pairs
- Repeating Group Identifiers
- Transaction Code
- Control Fields
- Mandatory Fields
- Data Element Types
- Field Overflow
- Null Value
- Code Lists
- Custom Tailored Schedules

VALUE PAIRS

Value pairs are the basic building block for the data entry technique employed in the GW input schedules. It provides the basis for avoiding the historical fixed format input structure. Under fixed format, each data element is assigned a column or set of columns on a particular card type. The value for that particular data element and only that element can be entered in that field.

Under this concept, a value pair consists of two segments: identifier and value. The two segments are separated by a separator and the value pairs are terminated by delimiters. Spaces between portions of a value pair are ignored. The result of this approach is that value pairs can "float" within the data portion of an input card or across cards.

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*The terms "form" and "schedule" are synonymous in this manual.

Each data element of the GW data base has been assigned a unique numeric identifier. These numbers are preprinted on the input forms. Following each identifier is a separator. The separator used defines two types of value pairs. That is, an equal sign (=) separator identifies an Assignment Value Pair and a pound sign (#) defines a Control Value Pair. Control value pairs are discussed later under "Control Fields."

The value segment following an equal sign specifies a value to be assigned to the identified data element. The value is delimited by the value pair delimiter, an asterisk (*). Note: For keypunching ease, the dollar sign can be used as an alternative to the asterisk, even though the asterisk is pre-printed on the input schedules.

An example "assignment" value pair is:

2 = C*

where 2 identifies the data element SITE-TYPE,

= specified that a value assignment is to be performed,

C is the value to be assigned SITE-TYPE, and,

* is the delimiter for the value pair.

REPEATING GROUP IDENTIFIER

Interrelated data elements are defined to SYSTEM 2000 as components of a repeating group (see System Overview). These groupings are reflected on the input schedules. Each group type is separated on the form by a bold horizontal line or the end of the page. Each occurrence of such a grouping is defined to the input system by "R-Value Pair." The R is the identifier and the value identifies the repeating group. For example:

R = 158*

identifies an owner's identification repeating group.

R = 0*

identifies data elements for the logical entry site.

The R-Value Pairs are pre-printed on the forms; with one exception they require no action from the person who completes the form. This one exception is on the part of the form dealing with production data. There, two value portions are printed, one for flowing wells and one for pumped wells. When this part of the form is completed, the appropriate number must be circled; circle 134 to indicate data for natural flow, or 146 to indicate data while pumping.

TRANSACTION CODE

A transaction code is required for each repeating group entry. The three general transaction types are:

A - add or create a new occurrence of the identified repeating group type (via the R-Value Pair) and assign values to its components according to the associated Assignment Value Pairs.

D - delete a specific, existing occurrence of the identified repeating group type (via the R-Value Pair).

M - modify a specific, existing occurrence of the identified repeating group type (vai the R-Value Pair).

A fourth transaction type is associated with the logical entry level (R=0), only:

V - annotate the logical entry to reflect that its data values have been verified.

The appropriate transaction code is entered as a "T-Value Pair." The T is the identifier portion of the value pair. This T identifies that the value portion signifies the type of action to be performed with regard to the identified repeating group. For example:

T = M*

directs that the associated Assignment Value Pairs are to be added to an existing, repeating group or to replace previously reported values; and

T = V*

directs that the specified site is to reflect that its data have been verified correct as recorded.

CONTROL FIELDS

To facilitate maintenance of the data base the user must be able to uniquely address or identify each logical entry or repeating group occurrence. In order to correct a value, to add a value, or delete a specific repeating group occurrence, there must be available one or more data elements whose values will uniquely identify the subject repeating group occurrence. At the logical entry level, this data element is the site identification number (SITE-ID). For a particular ownership entry, the date of ownership (OWNERSHIP-DATE) in conjunction with the site identification number provides this unique identification. Field water quality test results require a combination of the SITE-ID at the logical

entry level with three data elements at the repeating group level: date of the sample (FWQ-SAMPLE-DATE), the STORET parameter for the characteristic measured (FWQ-PARAMETER) and the geohydrologic identifier for the unit tested (FWQ-GEOHYDRO-UNIT).

In certain instances an artificial data element has been defined in order to provide this unique identification capability. This approach is only used in those cases where no single data element or combination of data elements will serve the purpose.

In these cases the artificial data element is called a sequence number or entry number. The latter term is more descriptive, since the values assigned each unique repeating group occurrence do not have to be sequentially assigned. The only requirement is that the values must not be duplicated within repeating groups with the same hierarchical parent. For example, repeating groups: hydraulic test data and coefficients of hydraulic tests have such artificial data elements. The value one may occur more than once throughout the data base for the hydraulic test's sequence number, but it cannot be duplicated within the same logical entry (site). In turn, the same value for the coefficients sequence number can occur several times throughout the data base and even in the same logical entry, but not within the same hydraulic test of the same logical entry.

In all cases such uniquely identifying data elements are classified as control fields. They are identified on the input schedules by the pound sign (#) separator. Note: The pound sign is not equivalent to the equal sign in that a value assignment is not effected by such a formatted value pair; except when the transaction code is "A" for add. In this situation the value following the # is assigned to the identified data element as well as used for control purposes. See Section C for procedures on how to change control field values.

Not all repeating groups can occur more than once per parent occurrence, for example, major pump data under lift data. These repeating groups do not, therefore, have control fields assigned or designated.

Note: Most control fields are also mandatory fields. (see below.)

MANDATORY FIELDS

Certain data elements in the data base are mandatory. That is, if the values for these data elements are missing the related entry or repeating group will not be established or added to the data base. An illegal value results in a missing value.

Data elements declared mandatory and which are related to the logical entry level will result in the rejection of the total entry if any one value is missing. Within lower level repeating groups, missing mandatory

field values will result in rejection of that particular repeating group's occurrence and all of its subordinate repeating groups. Note: A lower level repeating group can only exist if all of its succeeding higher hierarchical levels are also present.

Control fields are normally mandatory. Mandatory fields are identified on the schedules by being printed with red ink and being enclosed in a bolder box. They are further identified in the following pages with an asterisk (*) before their descriptions.

DATA ELEMENT TYPES

Five types of data elements are used in this data base: integer, decimal, date, name, and text. Each is defined under Data Element Formats of Section A. The following provides examples of correct and incorrect data input.

INTEGER

Correct

	1	2	3		
			1	2	3
	4	5	6	8	.
-	1	2	5	.	
	+	2			

Incorrect

		1		2	3
			A	2	3
4	5	6	.	8	
-		1	2	5	.
	+			3	

The maximum number of digits permitted in an integer field is the number of boxes provided on the input form. The use of a sign and/or decimal reduces the number of digits which can be recorded.

DECIMAL

Correct

	1	4	.	2	
	1	4	.	2	3
	1	4	.		
+	1	4	.	2	3
-	1	4	.	2	3

Incorrect

		1	4	.	2	.
	1	4		.		
		1	4	.		3
+		1	4	.	3	
	1	4	.	3	-	

The maximum number of integer and decimal digits permitted in a decimal field is specified by the number of boxes provided on the input form and

the placement of the preprinted decimal point. The use of a sign reduces the maximum number of integer digits allowable.

Note: The values recorded as:

1	4	.		
1	4	.	0	
1	4	.	0	0

are all equivalent.

DATE

Correct

1	2 / 2	5 / 1	9	7	4
0	1 / 0	1 / 1	9	0	1
0	7 / 0	3 / 1	9	6	2
1	1 / 0	2 / 1	9	3	4
0	5 / 0	5 / 1	9	0	5

Incorrect

1	2 /	5 / 1	9	7	4
	1 / 1	2 / 1	9	3	4
0	1 / 1	2 /		3	4
0	6 / 2	3 /			
0	5 / 3	4 / 1	9	6	4

The two digits for both the month and day, plus all four digits of the year must be entered. In addition, the edit program does not accept dates before the year 1800 or future dates. The slashes (/) are preprinted.

Note: Not all dates are accurately known, therefore, the GW system permits the day, or month and day portions to be reported as zero. The input system will generate a 01 or 01/01, respectively, in these cases and assign a code value to a related date accuracy element to indicate the degree of completeness of the reported date. The following examples show how incomplete data information should be recorded:

Correct

1	0 / 0	0 / 1	9	7	4
0	0 / 0	0 / 1	9	6	5

Incorrect

1	0 /		/ 1	9	7	4
	/		/ 1	9	6	5

NAME

All character combinations are permitted in name fields except for: *, =, #, $. It is important to understand how preceeding and imbedded spaces or blanks are handled in name fields.

Input

		A	B	C	D			
C	A	E		F			G	H
	A	B				C	D	E

Stored

A	B	C	D				
C	A	E		F		G	H
A	B		C	D	E		

The number of characters and non-redundant interspersed spaces which can be input is limited by the number of boxes provided for each particular element field on the input schedules.

TEXT

Text fields accept all character combinations (excluding the text delimiter character, ', single quote). All preceeding and imbedded spaces are retained.

Input

	'	A	B	C	D			
C	A	E		F			G	H
	A	B				C	D	E

Stored

		A	B	C	D			
C	A	E		F			G	H
	A	B				C	D	E

The size of the field is defined by the number of boxes provided on the input schedules.

Note: The text delimiter, ', can be overridden by replacing it by any other legal character, in this way the single quote can be used as part of the value. However, the substitute delimiter can not. The start and end text delimiters must both be overridden with the same substitution character.

Only two fields in the data base, local number and remarks, are defined as type TEXT. Under SYSTEM 2000 all leading imbedded blanks are retained in text-type entries as mentioned previously. It is very important, therefore, in coding these fields to omit leading and imbedded blanks which are not significant. This is especially important in the local-number field, which is a key field for retrieval. If the local number is entered as ␣DE-273 (␣ = blank), the record will not be retrieved by a request for local number DE-273; similarly if the number is entered as DE-273, it will not be retrieved by a request for ␣DE-273 or DE-␣273. Care should be taken when coding the local number for input and retrieval to insure that leading and imbedded blanks are considered. It is recommended that each district establish local conventions on the exact form of the local number and insure that they are followed.

FIELD OVERFLOW

All NAME fields that exceed 3 characters in length can overflow in SYSTEM 2000. Fields where overflow is deemed likely and acceptable have been provided with a secondary (shaded) area on the forms. The overflow space should not be used unless it is absolutely necessary because system performance and efficiency are seriously degraded if the number of overflow entries becomes too large. Every effort should be made to fit data into the defined space, use abbreviations and acronyms whenever possible. If field overflow cannot be avoided, see the instructions given under "Overflow Values" in Section C. In any event, a field cannot exceed a length of eighty characters.

NULL VALUES

The input forms cover the complete data-base definition, (except as noted in Appendix B) and therefore include fields for which data may not be available. Such fields should be ignored, both by the person who completes the forms and by the person who punches the data. These unused fields are carried in the data base with a value of "null" - no entry - and the fields are not normally included on output. DO NOT FILL UNUSED FIELDS WITH BLANKS OR ZEROS, the system distinguishes between entries of blank or zeros and "null".

Note: Repeating groups with all their data elements "null" should not be added to the data base. If already in existence they should be deleted. This will release unused space that can be used for another requirement.

CODE LISTS

Where codes for data elements are given in these instructions and listed on the schedules,[1] THEY ARE THE ONLY VALID ENTRIES FOR THAT DATA ELEMENT. Invalid codes are ALWAYS rejected by the input-edit program. If additional codes are needed for any data element, the proposed codes and their meanings must be submitted in writing to the GW Data Base Administrator for consideration. Proposed new codes cannot be used until approved. Upon approval all users will be notified.

CUSTOM-TAILORED SCHEDULES

Some users may find the official forms do not fit their unique requirements, especially if they contain data elements that are rarely or never

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[1]When codes are listed on the forms in the value segment of a value pair, the user need only circle the appropriate code.

collected by the field office. It is impractical for WRD to prepare and stock specialized forms for all user applications, therefore, the local preparation and use of customized forms is encouraged. The formats of data entered into the data base must satisfy the criteria of the input-edit program. Offices that intend to design their own input forms should contact the GW Data Base Administrator for instructions and guidance, and all locally-designed forms must be reviewed for acceptability by the GW/DBA before being implemented.

The remainder of this section describes each input schedule in detail. The reader should use the examples in Appendix A in conjunction with the data element descriptions. The schedules described and their associated examples are:

Schedule Name	Form number	Pages
Site	9-1904-A	A-7 thru A-10
Spring	9-1904-B	A-11 thru A-12
Lithologic	9-1904-F	A-13 thru A-14
Formation Hydraulics	9-1904-D (side 1)	A-15
Miscellaneous data	9-1904-D (side 2)	A-16
Water levels	9-1904-E	A-17

For convenience of reference the upper outside corner of each page identifies the subject matter for the page; the schedule name and the data grouping (repeating group). Data elements preceded by an asterisk (*) are mandatory items.

ADDENDUM - CODE LISTS

Certain codes that were inadvertently omitted from the forms or were added to the system after these forms were printed have been added to the text explanations, resulting in some discrepancies between the text and the forms. In all such cases, the list given in the text is correct and contains all the valid codes. The affected forms and fields are:

Site Schedule (Form 9-1904-A)

Site status (C37)	Code E (page B-28)
data location (C182)	Code R (page B-56)

Miscellaneous data schedule (Form 9-1904-D, side 2)

nature of repair	Code I (page B-85)

Water-level data schedule (Form 9-1904-E)

Site status (C238)	Code V (page B-28)
Method of measurement (C239 codes E, F, V, X)	(page B-28)

In addition, the source-of-data codes D-driller and L-logs, included in the spring schedule (Form 9-1904-B) are correctly omitted from page B-63. These codes are not applicable to spring data.

SITE SCHEDULE
(Reference Pages A-7 - A-10 of Appendix A)

GENERAL SITE DATA

*SITE IDENT. NO. (C1/SITE-ID): This is a 15-digit identification number assigned to the site, and is used primarily as an internal control number within the computer files. Although the site identification number is formed initially from the latitude and longitude of a point believed to represent the location of the site, the number is an IDENTIFIER and not a LOCATOR. It cannot be too strongly emphasized that the site identification number, once assigned, is a pure number and HAS NO LOCATIONAL SIGNIFICANCE; and once the number is assigned and entered into the data base, it SHOULD NEVER BE CHANGED. The site identification number is assigned as follows:

Spot the site on the best-available map as accurately as possible. If the site is a tunnel, spot the mouth of the tunnel; if the site is a drain, spot the discharge point of the drain; if the site is a pond or a multiple well field, spot the center of the pond or well field. Using an appropriate scaling aid, determine the latitude and longitude of the point on the map. The location of this point is always scaled to the nearest second of latitude and longitude, even if there is doubt about the exact location of the site or the accuracy of the map.

The first six digits of the identification number are the value of latitude, the seventh through thirteenth digits are the value of longitude, and the fourteenth and fifteenth digits are a sequence number. Use leading zeros if the value of latitude is less than 10 degrees, the value of longitude is less than 100 degrees, or the sequence number is less than 10. The site identification number must be 15 digits in length and it must not contain any blanks or alphabetic characters. If this procedure is followed, the number assigned should be unique. If the number is a duplicate of a site identification number already stored in the data base, the site record will not be entered; in that event, increment the sequence number and re-enter the data. The site identification number is a mandatory entry; no data will be stored for the site if the identification number is missing or invalid.

SITE TYPE (C2/SITE-TYPE): Circle the code indicating the type of site to which these data apply. The codes and their meanings are :

C - collector or Ranney type well.

D - drain dug to intercept the water table or potentiometric surface to either lower the ground-water level or serve as a water supply.

H - sinkhole.

I - interconnected wells, also called connector or drainage wells; that is, a well interconnected via an underground lateral.

M - multiple wells. Use only for well field consisting of a group of wells that are pumped through a single header and for which little or no data about the individual wells are available.

P - pond dug to intercept the water table or potentiometric surface and serve as a water supply.

T - tunnel, shaft, or mine from which ground water is obtained.

W - well, for single wells other than wells of the collector or Ranney type.

*DATA RELIABILITY (C3/RECORD-CLASSIFICATION): Circle the code indicating the reliability of the data available for the site. The codes and their meanings are:

C - the data have been field checked by the reporting agency.

U - the data were reported (by driller, owner, other agency, and so forth) and have not been field checked by the reporting agency, but the reporting agency considers the data reliable.

L - mostly unchecked data have been reported, and the location is not considered accurate.

M - minimal unchecked data were reported, and the location is uncertain.

Circle the code that best represents the reliability of the site's inventory data according to the reporting agency. When in doubt always select the code which portrays the lesser confidence. (Note: The codes are listed in order of decreasing confidence.) Data reliability is a mandatory entry; no data will be stored for the site if this field is blank.

*REPORTING AGENCY (C4/REPORTING-AGENCY): The agency that submitted the data to the data base. Enter the appropriate code; see Appendix E. The reporting agency is a mandatory entry; no data will be stored in the site if this field is blank.

PROJECT NO. (C5/PROJECT-NUMBER): This optional field is a retrieval key by means of which all the data collected or accessed for a particular project can be retrieved conveniently. If the field is used, enter the 10-character WRD project number associated with data collection at the site. Where no project number is applicable, leave the field blank.

*DISTRICT (C6/DISTRICT): Enter the district code identifying the WRD district that collects data at the site in the first two positions of the field. If data are collected by a subdistrict office, a one-character

code assigned by the district may be entered in the third space to identify the subdistrict office; such use is optional. The two-character district code is mandatory; no data will be stored for the site if this part of the field is left blank.

*STATE (C7/STATE): Enter the FIPS code for the State in which the site is located. State code is a mandatory entry; no data will be stored if this field is blank or invalid.

*COUNTY (C8/COUNTY): Enter the FIPS code for the county or county equivalent in which the site is located. County code is a mandatory entry; no data will be stored if this field is blank or invalid.

*LATITUDE (C9/LATITUDE): Enter the best available value for the latitude of the site in degrees, minutes, and seconds, right justified in the field. Use leading zeros if needed; 6 digit positions must be coded. If latitude of the site is south of the equator, precede the numbers with a minus sign (-) (the first position of the field is reserved for the sign, if required).

*LONGITUDE (C10/LONGITUDE): Enter the best available value for the longitude of the site, in degrees, minutes, and seconds, right justified in the field. Use leading zeros if needed; 7 digit positions must be coded. If longitude of the site is east of the Greenwich Meridian, precede the numbers with a minus sign (-) (the first position of the field is reserved for the sign, if required). The values of latitude and longitude entered in these fields are LOCATORS; they should represent the best available information about the location of the site. The location should be entered as precisely as it is known, and the accuracy of the location should be indicated by a suitable entry in the next field. Latitude and longitude are mandatory entries; no data will be stored if these fields are blank or invalid.

LAT-LONG ACCURACY (C11/COORDINATE-ACCURACY): Circle the appropriate code on the schedule to indicate the accuracy of the latitude-longitude values. The codes and their meanings are:

S - the measurement is accurate to ± 1 second

F - the measurement is accurate to ± 5 seconds

T - the measurement is accurate to ± 10 seconds

M - the measurement is accurate to ± 1 minute

No value indicates that the accuracy is unknown and is therefore assumed to be beyond one minute.

LOCAL NUMBER (C12/LOCAL-NUMBER): If a district well-numbering system is used, enter the system's number for the site here. The local

number should be entered completely, as it is to be printed, all edit characters used in printing the local number should be included. Note: This is a TEXT field (see Field Types).

LAND-NET LOCATION (C13/LAND-NET-LOCATION): Enter the legal description of the 10-acre tract in which the site is located, if applicable. The abbreviations NE, NW, SE, and SW are used for the quarter, quarter-quarter, and quarter-quarter-quarter. The smallest subdivision is listed first. Enter the appropriate code in the space for "meridian"; for example, 5th principal meridian = 5, Boise meridian = B. This is a NAME type field, therefore redundant internal blanks will be eliminated. Unused positions should be filled with zero or dash (-) to insure consistent formatting.

LOCATION MAP (C14/LOCATION-MAP-ID): Enter the name of the best available map on which the site can be located, preferably a USGS topographic quadrangle. If no topographic map is available for the area, a county highway map or similar map may be used. A length of 25 characters is allowed, but the last 5 positions (shaded on the forms) should not be used unless absolutely necessary.

SCALE (C15/LOCATION-MAP-SCALE): Enter the scale of the map identified in the previous entry, as follows. If the map scale is given as a ratio (1:24,000; 1:62,500, and so forth) omit figure "1" and the colon, and enter the remaining number without the comma. If the scale is given in miles per inch, as on many county highway maps, convert the scale to a ratio (multiply miles per inch by 63,360) and proceed as above. A 7½ minute quadrangle (1:24,000 scale) would be entered as 24000; a county or other map of 2 inches to the mile would be entered as 31680.

ALTITUDE (C16/ALTITUDE): Enter the altitude of the land surface at the site, in feet above or below mean sea level. Precision to two decimal places can be coded if available. Altitudes below mean sea level should be preceded by a minus sign (-).

METHOD OF MEASUREMENT (C17/ALTITUDE-METHOD): Circle the appropriate code for the method used to determine the altitude. The codes and their meanings are:

A - altimeter

L - level or other surveying method

M - interpolated from topographic map

Failure to select one of these values implies that the method is unknown.

ACCURACY (C18/ALTITUDE-ACCURACY): Enter the accuracy of the altitude in terms of the possible error in feet. An accuracy of ± 0.1 foot would be entered as .1. Spot elevations of wells shown on many topographic

maps of western States are accurate to ±1 foot; the method of measurement should be shown as M and the accuracy as 1. In general, the accuracy of altitudes interpolated from the contours on topographic maps is ± one-half the contour interval.

TOPO SETTING (C19/TOPOGRAPHIC-SETTING): Circle the code that best describes the topographic setting in which the site is located. Topographic setting refers to the geomorphic features in the vicinity of the site. Figure 4 illustrates many of these features. The codes and their meanings are:

C - stream channel

D - local depression

E - dunes

F - flat surface

H - hilltop

K - sinkhole

L - lake, swamp, or marsh

Ø - offshore (estuary)

P - pediment

S - hillside (slope)

T - alluvial or marine terrace

U - undulating

V - valley flat (valleys of all sizes)

W - upland draw

Stream channel (C) refers to the bed in which a natural stream of water runs. It is the trench or depression washed or cut into the surface of the earth by the moving water that it periodically or continuously contains. This term includes washes, arroyos, and coulees.

A local depression (D) is an area that has no external surface drainage. Some depressions, such as those in the High Plains, are only a few acres in extent, but others may cover a square mile. Do not use this designation for small "interdune depressions" or those on an undulating surface of glacial drift (use undulating). Do not use for large closed basins such as those on the Basin and Range province (use local features).

Dunes (E) refers to mounds and ridges of windblown, or eolian, sand. This term should not be used for an isolated mound unless it has a rather extensive area and is of hydrologic significance to the site.

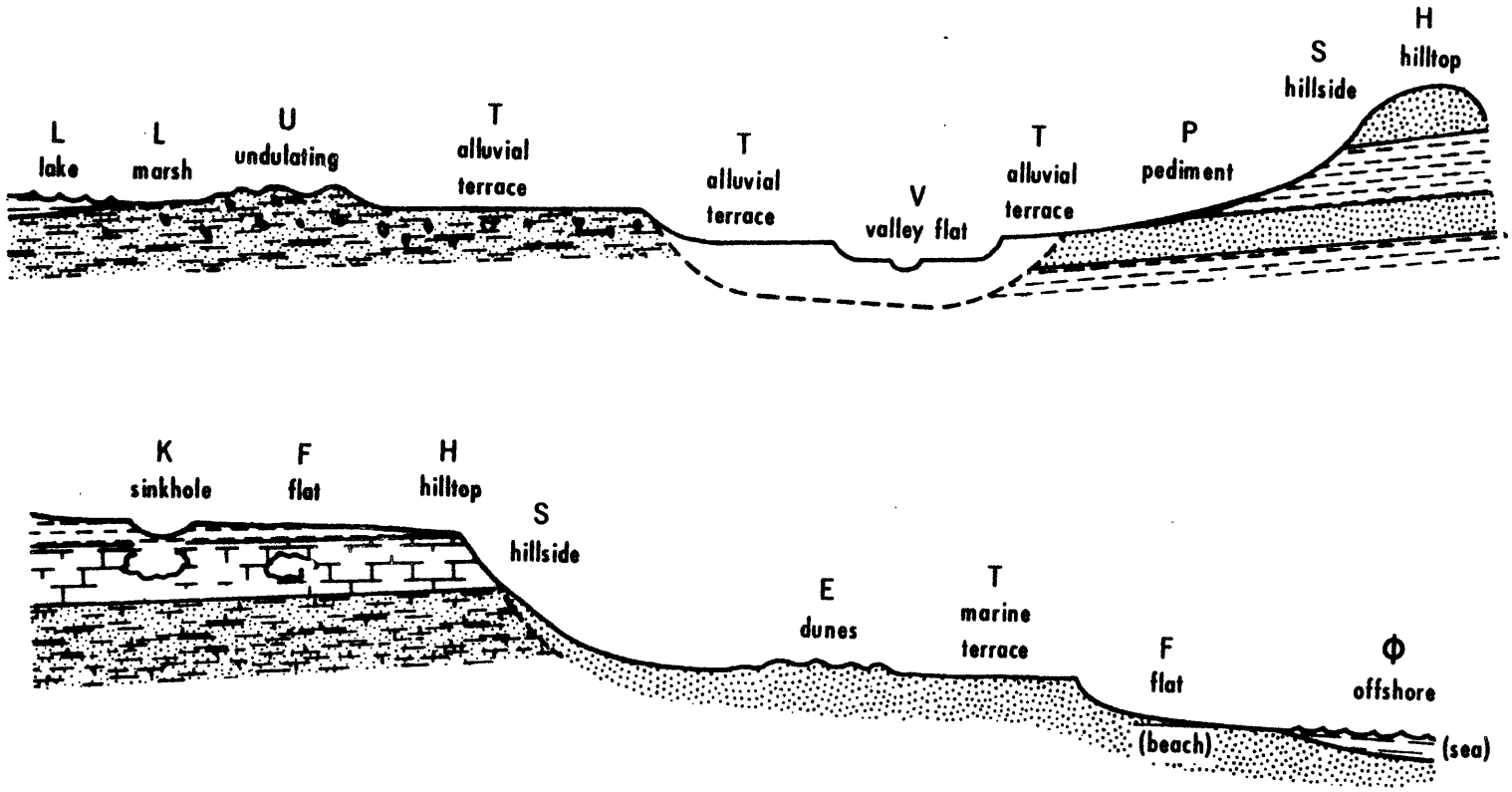

FIGURE 4: Diagrammatic sketch of topographic features

A flat surface (F) may be part of a larger feature such as an upland flat, mesa or plateau, coastal plain, lake plain, or pediment. Terraces and valley flats, which are special varieties of flat surfaces, are classified separately.

A hilltop (H) is the upper part of a hillor ridge above a well-defined break in slope. A site on the crest of an escarpment or top of a cuesta slope (diagram) should be in this category. Use this category for hills of significant height (such as drumlins) above a generally flat area, but not for small "swells" a few feet high on an undulating surface such as a till plain or valley flat.

A sinkhole (K) is a special type of depression that results from the dissolving of soluble rocks (salt, gypsum, limestone) and the subsequent collapse of the earth into the solution cavity. As such it has special significance to the understanding of the hydrology in the vicinity of the site.

Lake (L) refers to a body of inland water. However, this code also may be used for swampy or marshy areas where the ground may be saturated or water may stand above the land surface for a period of time.

Offshore (Ø) refers to a site along a coast or estuary that is continuously submerged.

Pediment (P) refers to a plain of combined erosion and deposition that forms at the foot of a mountain range.

A hillside (S) is the sloping side of a hill--that is, the area between a hilltop and valley flat. The important factor is the general aspect of the site. The steepness of the slope or height of the hill are not significant.

An alluvial or marine terrace (T) is generally a flat surface, usually parallel but elevated above a stream valley or coast line. Characteristically, the terrace is separated from an adjacent upland on one side and a lowland (coast or valley) on the other by steep slopes or escarpments. Due to the effects of erosion the terrace surface may not be as smooth as a valley flat and within the general terrace area there may be undulating areas of dune sand or hill slopes.

Undulating (U) topography is characteristic of areas which have many small depressions and low mounds. An undulating surface is primarily a depositional feature, not an erosional one. The term should not be misused for areas that have slightly irregular surfaces resulting from erosion.

A valley flat (V) is a low flat area between valley walls and bordering a stream channel. It includes the flood plain and generally is the

flatest area in the valley. The surface may have a slight slope toward the main stream, toward the valley walls, or may be marked by valleys or smaller streams. Generally the valley flat is separated from alluvial terraces or from the upland by a pronounced break in slope. Sometimes, however, the erosion of adjacent upland and the deposition of colluvium may mask the outer edge of the alluvial flat. Use for sites in small valleys on a plain if the site taps alluvium or the valley situation has hydrologic significance.

An upland draw (W) is a small natural drainageway or depression, usually dry, on a hillside or upland.

HYDROLOGIC UNIT (C20/OWDC-HYDROLOGIC-UNIT): the OWDC (Office of Water Data Coordination) cataloging unit in which the site is located. This information is available from maps furnished by OWDC.

DATE OF CONSTRUCTION/COMPLETION (C21/DATE-CONSTRUCTED): The date on which the initial construction at the site was completed (first completion) or the date on which the site was available for operation. Enter month, day, and year in the spaces indicated. If the month or day are not known, enter 00 in the spaces. Using leading zeros for month or day values less than 10 and all four digits of the year must be specified.

USE OF SITE (C23/SITE-USE): Circle the code indicating the principal use of the site or the purpose for which the site was constructed (the former always holds precedence over the latter). The codes and their meanings are:

A - anode
D - drain
E - geothermal
G - seismic
H - heat reservoir
Ø - observation
M - mine
P - oil or gas well
R - recharge
S - repressurize
T - test
U - unused
W - withdrawal of water
X - waste disposal
Z - destroyed

Anode (A) is a hole used as an electrical anode. Include in this category wells used solely to ground pipelines or electronic relays and other installations.

Drainage (D) means the drainage of surface water underground.

Geothermal (E) well is a hole drilled for geothermal energy development. Use this category for "dry" geothermal wells or wells into which

water is injected for heating. For "wet" geothermal wells, through which water is withdrawn, use W - withdrawal of water for the use of site and E - power generation for the primary use of water.

Seismic (G) hole is one drilled for seismic exploration. If it has been converted to water supply, it is used to withdraw water. A seismic hole used as an observation well should be in the observation-well category (Ø).

Heat reservoir (H) refers to a well in which a fluid is circulated in a closed system. Water is neither added to nor removed from the aquifer.

Mine (M) includes any tunnel, shaft, or other excavation constructed for the extraction of minerals.

Observation (Ø) well is a cased test hole or well drilled for observations, either water-level or quality of water. Do not use this category for an oil-test hole, or water-supply well used only incidentally as an observation well.

Oil or gas (P) well is any well or hole drilled in search of or for production of petroleum or gas and includes any oil or gas production well, dry hole, core hole, injection well drilled for secondary recovery of oil, etc. An oil-test hole converted to a water supply well should be classified as withdrawal (W).

Recharge (R) site is a site constructed for or converted for use in replenishing the aquifer. An irrigation well used to return water to the aquifer during nonpumping periods is a well for withdrawing water, not a drainage or recharge well. Use this category for wells that are used to return water to the aquifer after use, such as those for returning air-conditioning water.

Repressurize (S) refers to pumping water into an aquifer in order to increase the pressure in the aquifer for a specific purpose, for example, water flood purposes in oil fields.

Test hole (T) is an uncased hole (or one cased only temporarily) that was drilled for water, or for geologic or hydrogeologic testing. It may be equipped temporarily with a pump in order to make a pumping test, but if the well is destroyed after testing is completed, it is still a test hole. A core hole drilled as a part of mining or quarrying exploration work, which is geologic, should be in this class.

An unused (U) site is an abandoned water-supply site or one for which no use is contemplated. At an abandoned farmstead, a well originally used for domestic purposes may be classed as unused even though it is equipped with a pump. Similarly a stock well, with a pump, may become unused when

a pasture or corral is put into cultivation. An irrigation well that is not equipped with a pump nor used because the yield is too low or the water is too mineralized belongs in this class.

Withdrawal of water (W) refers to a site that supplies water for one of the purposes shown under use of water. It includes a dewatering well, if the dewatering is accomplished by pumping ground water.

A waste-disposal (X) site is one used to convey industrial waste, domestic sewage, oil-field brine, mine drainage, radioactive waste, or other waste fluid into an underground zone. An oil-test or deep-water well converted to waste disposal should be in this category.

A destroyed (Z) site is one that is no longer in existence. The casing of most destroyed wells will be pulled, but some may be plugged or filled. Do not use this category for an abandoned site that merely is not in use.

USE OF WATER (C24/WATER-USE): Circle the code indicating the principal use of water from the site. If water from the site is used for more than one purpose, circle the principal use here and enter the subordinate uses in the following two fields. The codes and their meanings are:

A - air conditioning	I - irrigation	U - unused
B - bottling	M - medicinal	Y - desalination
C - commercial	N - industrial	Z - other (explain in remarks)
D - dewater	P - public supply	
E - power	R - recreation	
F - fire	S - stock	
H - domestic	T - institution	

If a code of "Y" desalination is used, enter the purpose for which the desalinated water is used in the next field, secondary water use.

Air conditioning (A) refers to water supply used solely or principally for heating or cooling a building. Water used to cool industrial machinery belongs in the industrial category, not in the air-conditioning category.

Bottling (B) refers to the storage of water in bottles and use of the water for potable purposes (see Medicinal).

Commercial (C) use refers to use by a business establishment that does not fabricate or produce a product. Filling stations and motels are examples of commercial establishments. If some product is manufactured, assembled, remodeled, or otherwise fabricated, use of water for that

plant should be considered industrial even though the water is not used directly in the product or in the manufacturing of the product.

Dewatering (D) means the water is pumped for dewatering a construction or mining site, or to lower the water table for agricultural purposes. In this respect, it differs from a drainage well that is used to drain surface water underground. If the main purpose for which the water is withdrawn is to provide drainage, dewatering should be indicated even though the water may be discharged into an irrigation ditch and subsequently used to irrigate land.

Power generation (E) refers to use of water for generation of any type of power.

Fire protection (F) refers to the principal use of the water and should be indicated if the site was constructed principally for this purpose even though the water may be used at times to supplement an industrial or defense supply, to irrigate a golf course, fill a swimming pool, or for other use.

Domestic (H) use is water used to supply household needs, principally for drinking, cooking, washing, and sanitary purposes, but including watering a lawn and caring for a few pets. Most domestic wells will be at suburban or farm homes but wells supplying small quantities of water for domestic purposes for one-classroom schools, turnpike gates, and similar installations should be in the domestic category.

Irrigation (I) refers to the use of water to irrigate cultivated plants. Most irrigation sites will supply water for farm crops, but the category should include wells used to water the grounds of schools, industrial plants, or cemeteries if more than a small amount of water is pumped and that is the sole use of the water.

Medicinal (M) refers to water purported to have therapeutic value. Water may be used for bathing and/or drinking. If use of water is mainly because of its claimed therapeutic value, use this category even though the water is bottled.

Industrial (N) use is within a plant that manufactures or fabricates a product. The water may or may not be incorporated into the product being manufactured. Industrial water may be used to cool machinery, to provide sanitary facilities for employees, to air condition the plant, and to irrigate the ground at the plant. The water used for mining or to operate ore mills should be included in the industrial category.

Public supply (P) use is water that is pumped and distributed to several homes. Such supplies may be owned by a municipality or community, a water district, or a private concern. In most states public supplies are regulated by departments of health which enforce minimum safety and

sanitary requirements. If the system supplies five or more homes, it should be considered a public supply; for four or fewer classify use as domestic. Water supplies for trailer or summer camps with five or more living units should be in this category, but motels and hotels are classified as commercial. Most public supply systems also furnish water for a variety of other uses such as industrial, institutional, and commercial.

Recreation (R) refers to water discharged into pools, or channels which are dammed downstream to form pools, for swimming, boating, fishing, ice rinks, and other recreational uses.

Stock supply (S) refers to the watering of livestock.

Institutional (T) refers to water used in the maintenance and operation of institutions such as large schools, universities, hospitals, rest homes, or similar installations. Owners of institutions may be individuals, corporations, churches, or governmental units.

Unused (U) means water is not being removed from the site for one of the purposed described above. A test hole, oil or gas well, recharge, drainage, observation, or waste-disposal well will be in this category. Do not use this classification for an irrigation, domestic, stock, or other well during "off season" or temporary periods of nonuse. The use of water from a newly constructed site should be considered as the use for which it is intended even though it may not yet be in use when inventoried.

Desalination (Y) refers to water used in a desalting process whereby dissolved solids are removed to make water potable or suitable for other uses.

Other (Z) refers to miscellaneous uses not included in the listed categories.

SECONDARY WATER USE (C25/SECOND-WATER-USE): If water from the site is used for more than one purpose, show the secondary use here. Enter an appropriate code from the list above.

TERTIARY WATER USE (C26/THIRD-WATER-USE): If needed, a third use of water from the site can be shown here. Enter an appropriate code from the list above.

DEPTH OF HOLE (C27/HOLE-DEPTH): Enter the total depth to which the hole was drilled, in feet below the land surface datum, even though it may have been plugged back in completing the well. For collector or Ranney type wells, enter the depth of the central shaft. For multiple-well fields, ponds, tunnels, or drains, leave the space blank. This

field should be completed for wells whenever possible; if the hole depth is given, all other depths entered on the schedule will be compared with it for validity. Precision may be carried to two decimal places.

DEPTH OF WELL (C28/WELL-DEPTH): Enter the depth of the finished well, in feet below land surface datum. The depth of the well is the greatest depth to which the well can be sounded; if measurement is not practicable, enter the reported depth at which the well was finished.

SOURCE OF DEPTH DATA (C29/WELL-DEPTH-SOURCE): Enter an appropriate code to indicate how the information about the depth of the well was obtained. The codes and their meanings are:

A - reported by another government agency. Do not use "A" if the reporting agency is the owner of the well--use "Ø".

D - From drillers' log or report.

G - private geologist-consultant or university associate.

L - depth interpreted from geophysical logs by personnel of source agency.

Ø - reported by the owner of the well.

R - reported by person other than the owner, driller, or another government agency.

S - measured by personnel of reporting agency.

Z - other source (explain in remarks).

WATER LEVEL (C30/WATER-LEVEL): Enter the water level at the site, in feet below land surface. Precision can be carried to two decimal places. If the water level is above land surface, precede the numbers with a minus sign (-)--head above land surface is negative depth below land surface. If the site flows but the head is not known, or the site is dry, leave this space blank and see SITE STATUS.

DATE MEASURED (C31/WATER-LEVEL-DATE): Enter the date on which the water level was measured. Show month, day, and year in the spaces indicated. If the day and/or month are not known, show them as 00. Use leading zeros for values of month and day that are less than 10, and provide all four digits of the year.

SOURCE (C33/WATER-LEVEL-SOURCE): Enter the code indicating the source of the water-level data. The codes are the same as those used for Source of Depth Data (above).

METHOD OF MEASUREMENT (C34/WATER-LEVEL-METHOD): Enter the code indicated how the water level was measured. The codes and their meanings are:

A - airline measurement

C - calibrated airline measurement

E - estimated

G - pressure-gage measurement

H - calibrated pressure-gage measurement

L - interpreted from geophysical logs

M - manometer measurement

R - reported, method not known

S - steel-tape measurement

T - electric-tape measurement

V - calibrated electric-tape measurement

Z - other

SITE STATUS (C37/SITE-LEVEL-STATUS): Circle the code indicating the status of the site at the time the water-level was measured. The codes and their meanings are:

D - the site was dry (no water level is recorded).

E - the site had been flowing recently, but a head measurement was made.

F - The site was flowing, but the head could not be measured (no water level is recorded).

G - a nearby site that taps the same aquifer was flowing.

H - a nearby site that taps the same aquifer had been flowing recently.

Ø - an obstruction was encountered in the well above the water surface (no water level is recorded).

P - the site was being pumped.

R - the site had been pumped recently.

S - a nearby site that taps the same aquifer was being pumped.

T - a nearby site that taps the same aquifer had been pumped recently.

V - foreign substance present on the surface of the water.

X - water level affected by stage in nearby surface-water site.

Z - other conditions that would affect the measured water level (explain in remarks).

If no site status is indicated, the reported water-level measurement represents a static level.

SOURCE OF GEOHYDROLOGIC DATA (C36/GEOHYDRO-DATA-SOURCE): If geohydrologic data about the site are coded later in the schedule, indicate here the source of the data. If no geohydrologic information is available, leave the field blank. The codes are the same as those used for Source of Depth Data (page B-27).

PUMP USED (C35/PUMP): Enter an N in this field if the well is known not to have a pump. Do not code this field if there is no information about the presence or absence of a pump. The purpose of the field is to indicate that information about the pump is missing because there is no pump; if there is no information about the pump for other reasons, leave the field blank.

MP (C266/MEASURING-POINT-HEIGHT): For observation wells or other wells where repeated measurements are made, enter the height of the measuring point above or below land surface. Data for measuring points above land surface should be preceded by a minus sign (-). For observation wells, a detailed description of the measuring point may be entered either in the "Remarks" field (p. B-61) or the "Observation Well heading" field (p. C-15).

MP DATE (C267/MEASURING-POINT-DATE): If a value for measuring-point height is entered, indicate the date on which this height was measured, that is, the date on which this MP was last established. No date accuracy code is associated with this field, therefore, the entry must be a valid date (see p. B-10).

OWNER

Space is provided here for recording the ownership of the site. If desired, this group can be repeated to keep a complete history of the ownership of the site.

If the site is used, leased, or occupied by someone other than the owner, this fact should be entered in the REMARKS repeating group, together with the name of the user, lessee, or tenant.

*DATE OF OWNERSHIP (C159/OWNERSHIP-DATE): Enter the date that this owner acquired ownership of the ground-water source, or the earliest date on which this owner was known to own the source. If the day or month are not known, enter 00 in these spaces. Use leading zeros for month and day values less than 10. Specify all four digits of the year. This date is a mandatory entry for owner identification; no information about ownership will be stored if the date is missing or invalid.

*LAST NAME (C161/LAST-NAME): Enter the last name of the owner. This is a mandatory entry; no ownership data will be stored if a last name is not specified.

FIRST NAME (C162/FIRST-NAME): Enter the first name of the owner. If more than 10 characters are required, use abbreviations.

MIDDLE INITIAL (C163/MIDDLE-INITIAL): Enter the middle initial of the owner.

For multiple ownership, enter the last name of one owner in last name followed by a space and an ampersand (&), and enter the last name of the second owner in first name. For more than two owners, use "and others" in the space for first name after entering one owner in last name. For ownership by a company, municipality, government agency, or other organizations, enter the name in the field for last name. Use meaningful abbreviations to keep the name within 15 characters.

OTHER SITE IDENTIFICATION NUMBER

Municipalities, water companies, government agencies, and some individuals that have a number of wells or other ground-water sources often assign names or numbers to individual sites. State agencies concerned with water rights frequently identify wells by permit number or some other numbering scheme. This field is provided for recording such numbers or names that may be useful in identifying the site and correlating with the records of other persons. Space is provided on the schedule for two such extra identifiers; if more than two exist, enter them on another form and attach it to the schedule. Note: the section titled COOPERATOR DATA provides for another means of defining other site identifiers.

*IDENT (C190/OTHER-ID): Enter the name or number by which the site is identified. Space is provided for up to 10 characters. This is a mandatory data element, and other site identification entry will not be accepted without a value for this field.

ASSIGNER (C191/OTHER-ID-ASSIGNER): Enter the name or other identification of the person or organization that assigned the number for the site. Space is provided for up to 15 characters; if the name is longer, use meaningful abbreviations or acronyms.

If this repeating group is used for identifiers assigned to many sites, such as numbers assigned by the district office or by a state agency, care must be taken to insure that the identical name, abbreviation, or acronym is used in all cases. Failure to do so will lead to problems in retrieving specific values from the repeating group.

SITE VISIT DATA

This space is used to record the date of the inventory of, or visits to, the site and the name of the person who made the inventory or visit. If desired, this group may be repeated to keep a history of the inventory activity at the site or an indication of the data's most recent re-verification.

*DATE OF VISIT (C187/INVENTORY-DATE): Enter the complete date on which the site was inventoried or visited. Use leading zeros for values of day or month less than 10. Specify all four digits for the year. This entry is mandatory, a site visit will not be recorded without the date of visit.

NAME OF PERSON (C188/INVENTORY-PERSON): Enter last name and the initials of the person who made the site inventory or visit. Leave a space between the last name and initials, do not include periods. For example, Charlie Arthur Brown would be entered as B R O W N ∅C∅A.

FIELD WATER QUALITY MEASUREMENTS

This space on the schedule is used to record the values of water-quality parameters collected on a "one-time" basis in the field when the site is inventoried. The results of laboratory analyses or repetitive field measurements should not be included here, but should be stored in the water quality or daily-values file. Space is provided for recording two parameters in addition to temperature and specific conductance; if more than two parameters are measured, use an additional schedule.

*DATE (C193/FWQ-SAMPLE-DATE): Enter the complete date on which the field water-quality data were collected. If the day or month are not known, enter 00 in these spaces. Use leading zeros for values of day or month that are less than 10. Specify all four digits of the year. Date is a mandatory field for water-quality data; no field water-quality data will be stored if this field is missing or invalid.

GEOHYDROLOGIC UNIT (C195/FWQ-GEOHYDRO-UNIT): Enter the 8-character code that identifies the aquifer or geologic unit from which the water sample came. Use the codes in the "Catalog of Aquifer Names and Geologic Unit Codes Used by the Water Resources Division." This entry is an exception to the rule that a control field is also a mandatory field. C195 is not mandatory. If the combination of date and STORET parameter can not guarantee unique identification of a measurement, this field must be provided or the entry will not be accepted.

*WATER QUALITY PARAMETER (C196/FWQ-PARAMETER): Enter the appropriate WQ parameter code from the WATSTORE code list for a field-determined water quality characteristic. Space is provided for four entries, the first two have been preprinted for temperature and conductance, respectively.

*VALUE (C197/FWQ-MEASUREMENT): Enter the measured value for the field water quality characteristic. Except for conductance, space is provided to indicate precision to one decimal place. However, the values should be recorded in the units and to the precision required by the Water Quality reporting system for that parameter; for example, report temperature to tenths of degrees Celsius and conductance in whole micromhos.

SITE CONSTRUCTION DATA

This part of the form is used to record information about the construction details of the site.

*ENTRY NO. (C59/CONST-SEQ-NO): Because construction information can be entered more than once for a given site (as when major deepening or other work is done), an identifying number must be provided for each entry of construction data. The number provided for a site need not be sequential, but each must be unique for that site. The entry number is mandatory for construction data; no data about construction will be stored if this field is missing or invalid.

*DATE OF CONSTRUCTION COMPLETION (C60/DATE-COMPLETED): Enter the complete date on which the work was completed. If the day or month are not known, enter 00 in the spaces. Use leading zeros for values of day and month less than 10, and specify all four digits for the year. For many sites, this date will be the same as the one entered earlier on the form (Date of Construction/Completion); however, it must be re-entered here. Date of construction is a mandatory entry for construction data: no data about construction will be stored if this field is missing or invalid.

SOURCE OF CONSTRUCTION DATA (C64/CONST-DATA-SOURCE): Enter the code for the source of the construction data, that is, who furnished the data. The codes are the same as those used for Source of Depth Data above (page B-27).

NAME OF CONTRACTOR/DRILLER (C63/CONTRACTOR): Enter the name of the individual or company that did the work. For company names, use meaningful abbreviations or acronyms if needed to fit the space.

METHOD OF CONSTRUCTION (C65/CONST-METHOD): Circle the code indicating the method by which the site was constructed. The codes and their meanings are:

A - air-rotary	P - air percussion
B - bored or augered	R - reverse rotary
C - cable-tool	T - trenching
D - dug	V - driven
H - hydraulic rotary	W - drive and wash
J - jetted	Z - other (explain in remarks)

Air-rotary (A) method is one in which a stream of air is used to cool the bit and bring the rock cuttings to the surface.

A bored or augered (B) hole is one in which the earth materials are cut and removed from the hole with an auger. The auger may be powered by hand or machinery.

Cable-tool (C) refers to a well drilled by the familiar "percussion" or "churn-drill" method whereby a heavy drilling tool is raised and lowered with enough force to pulverize the rock. The rock debris is commonly removed from the hole with a bailer. The California mud-scow method is a special variation of the cable-tool method.

Dug (D) holes are excavated by hand tools or power-driven digging equipment, such as clam-shell diggers, back-hoes, or power shovels, that dig and remove the material in one operation. Caissons, Ranney-type collectors, and galleries belong in this classification even though they may have laterals that are driven or jetted. Tunnels would also be in this category.

The hydraulic-rotary (H) well is constructed by rotating a length of pipe (drill stem) equipped with a bit that cuts or grinds the rocks. Water or drilling mud is pumped down the pipe and carries the cuttings to the surface in the annular space between the pipe and the wall of the hole. Note that separate categories are provided for air-rotary and reverse-rotary.

Jetted (J) wells are excavated by using high-velocity streams of water pumped through a pipe having a restricted opening or "jetting" nozzle. For some types of earth materials a cutting bit is attached to the end of the jetting pipe. The material cut or washed from the hole is carried to the surface in the annular space outside the pipe as by the hydraulic-rotary method. This method is most suitable for construction of small-diameter wells in poorly consolidated material.

An air-percussion (P) drill is a cutting unit which is powered by compressed air and uses a rapid percussion effect, coupled with rotary action, to drill hard rocks. Compressed air also is used to blow the cuttings from the hole. Air-percussion drills are generally used in conjunction with air-rotary drilling rigs.

Reverse rotary (R) is similar to the hydraulic rotary except that the water or drilling mud flows down the annular space between the drilling stem and the wall of the hole and the cuttings are pumped out through the drill stem.

Trenching (T) refers to the construction of a sump of open pit from which ground water may be pumped. Trenching may be done by hand but more commonly power equipment, such as a bulldozer, dragline, power shovel, or a back-hoe is used. Ponds and drains belong in this category of construction.

Driven (V) wells are constructed by driving a length of pipe, usually of small diameter and generally equipped with a sand point, to the desired depth. The wells may be driven by hand or with air hammer or other powered equipment. An essential feature of a driven well is that no earth material is removed as the well is constructed.

Drive and wash (W) wells are constructed by driving a small diameter open-end casing a few feet into the earth, then washing out the material from inside the casing with a jet of water. The process is repeated until the well has penetrated a sufficient depth into the aquifer.

FINISH (C66/FINISH): Circle the code indicating the method of finish or the nature of the openings that allow water to enter the well. The codes and their meanings are:

C - porous concrete
F - gravel pack w/perforations
G - gravel pack w/screen
H - horizontal gallery
Ø - open end
P - perforated or slotted
S - screen
T - sand point
W - walled
X - open hole
Z - other (explain in remarks)

Porous concrete (C) is concrete casing that is not impervious but allows ground water to seep into the well.

A gravel wall (F & G) well is a drilled or dug well that has a gravel envelope opposite the part through which water enters. Commonly, these wells will be finished either with commercial screen or with torch-slotted or machine-slotted casing.

A horizontal gallery or collector (H) essentially is a horizontal-type well in which the screen, slotted pipe, or gravel-filled trench is horizontal. Ranney collectors and infiltration galleries are of this type, but all horizontal wells should be in this class.

An open-end (Ø) well is one that is cased to the bottom of the hole so that water can enter the well only through the bottom of the hole.

Perforated or slotted (P) casing is well pipe that has had holes punched or slots cut in it to admit water. Perforations may be cut, drilled, or punched in the casing in the shop or during manufacture. Pipe may be perforated in a well, using commercial "gun perforating" services. Slots may be cut by torch, machine cut in the shop, or even cut in the well. Light-weight galvanized well casing with pressed louver-type openings is perforated casing, not screen.

Screen (S) refers to commercial well screen manufactured for the purpose of admitting water to a well. Common types of screen are wire mesh, wrapped trapezoidal wire, and shutter screen.

A sand point (T) is the screen part of a drive point and usually is part of a driven well or may be used to deepen a drilled or dug well.

A walled or shored (W) well is usually a dug well in which the walls have been shored up with open-jointed fieldstone, brick, tile, concrete blocks, wood cribbing, or other material. A few wells of this type may have gravel walls; however, they should be placed in this category instead of F or G. A dug well that is mostly open hole but has only a few feet of cribbing, corrugated pipe, or other shoring to prevent caving should be in this category.

An open (X) hole is cased below the depth of possible surface contamination, slumpage, or into solid rock and finished open hole in the aquifer. A well belongs in this class even if the casing does not actually extend to the geologic unit or zone from which the water is obtained.

TYPE OF SURFACE SEAL (C67/SEAL-TYPE): Circle the code indicating the type of material used to seal the well against the entry of surface water. The codes and their meanings are:

B - bentonite	G - cement grout
C - clay or cuttings	Z - other (explain in remarks)

BOTTOM OF SEAL (C68/SEAL-BOTTOM): Enter the depth to the bottom of the seal, in feet below land surface.

METHOD OF DEVELOPMENT (C69/DEVELOPMENT-METHOD): Circle the code indicating the method used to develop the well. The codes and their meanings are:

A - pumped with air lift	N - none
B - bailed	P - pumped
C - "blown" or surged w/compressed air	S - surged with surge block
J - washed or jetted	Z - other (explain in remarks)

NUMBER OF HOURS OF DEVELOPMENT (C70/DEVELOPMENT-DURATION): Enter the number of hours that the well was bailed, pumped, and so forth, for development.

SPECIAL TREATMENT DURING DEVELOPMENT (C71/SPECIAL-TREATMENT): Circle the code indicating any special treatment that was applied during

development of the well. The codes and their meanings are:

C - chemicals (acid, and so forth)
D - dry ice
E - explosives
F - deflocculent
H - hydrofracturing
M - mechanical abrasion
Z - other (explain in remarks)

DIMENSIONS OF THE HOLE CONSTRUCTED

This part of the form is used to record information about the hole in which a well or collector is installed. Space is provided for four changes in diameter; if more space is needed, use and attach an additional form.

*CONSTRUCTION ENTRY NO. (C59/ENTRY-NO): Enter the sequential number assigned under "entry number" in "site construction data" above. This number is needed to relate the hole data to the proper set of construction information. The entry number is mandatory; no information about the hole will be stored if the number is missing or invalid.

*TOP OF HOLE SEGMENT BELOW LSD (C73/HOLE-TOP): Enter the depth to the point where this section of hole begins, in feet below land surface. The first section of hole begins at depth 0. This value is mandatory; no information about this hole segment will be stored if this field is missing or invalid.

BOTTOM OF HOLE SEGMENT BELOW LSD (C74/HOLE-BOTTOM): Enter the depth to the bottom of the hole segment, in feet below land surface.

*DIAMETER OF HOLE SEGMENT (C75/HOLE-DIAMETER): Enter the nominal diameter of the bit used to drill this section of the hole or the diameter to which the hole was reamed, in inches. This value is mandatory; no information about the hole segment will be stored if this field is missing or invalid.

CASING SCHEDULE

This part of the form is used to record data on the casing in a well. Space is provided to record information about 5 strings of casing; if more space is needed, use and attach an additional form.

*CONSTRUCTION ENTRY NO. (C59/ENTRY-NO): Enter the sequential number assigned under "entry number" in "site construction data" above. This number is needed to relate the casing schedule to the proper set of construction information. The entry number is mandatory; no information about the casing will be stored if this field is missing or invalid.

*TOP OF CASING SEGMENT BELOW LSD (C77/CASING-TOP): Enter the depth to the top of this section of casing, in feet below land surface. If the casing extends above land surface, enter the height of the casing above land surface preceded by a minus sign (-). This field is a mandatory control field; the casing information will be rejected if a value is not specified.

BOTTOM OF CASING SEGMENT BELOW LSD (C78/CASING-BOTTOM): Enter the depth to the bottom of this section of casing, in feet below land surface.

DIAMETER OF CASING SEGMENT (C79/CASING-DIAMETER): Enter the nominal diameter of this section of casing, in inches. Two decimal places are provided for fractional sizes (1¼ = 1.25). This is an "optional control" field, that is, the value is not mandatory but if specified, it further identifies the casing segment.

*CASING MATERIAL (C80/CASING-MATERIAL): Enter the code indicating the material from which the casing is made. The codes and their meanings are:

B - brick	R - rock or stone
C - concrete	S - steel
G - galvanized iron	T - tile
I - wrought iron	U - coated steel
M - other metal	W - wood
P - PVC, fiberglass, other plastic	Z - other material (explain in remarks)

THICKNESS OF CASING (C81/CASING-THICKNESS): Enter the thickness of the casing wall, in inches. Three decimal places are provided.

OPENINGS SCHEDULE

This part of the form is used to record information about the openings through which water enters a well. Space is provided for coding three open intervals; if more space is needed, use and attach another form.

*CONSTRUCTION ENTRY NO. (C59/ENTRY-NO): Enter the sequential number assigned under "entry number" in "site construction data" above. This number is needed to relate the openings information to the proper set of construction information. The entry number is mandatory; no information about the open intervals will be stored if this field is missing or invalid.

*TOP OF OPENINGS BELOW LSD (C83/OPENING-TOP): Enter the depth to the top of the open section, in feet below land surface. This field is mandatory; no information about the open interval will be stored if this field is missing or invalid.

BOTTOM OF OPENINGS BELOW LSD (C84/OPENING-BOTTOM): Enter the depth to the bottom of the open section, in feet below land surface.

*TYPE OF OPENING (C85/OPENING-TYPE): Enter the code indicating the type of open section. The codes and their meanings are:

F - fractured rock
L - louvered or shutter-type screen
M - mesh screen
P - perforated, porous, or slotted casing
R - wire-wound screen
S - screen, type not known
T - sand point
W - walled or shored
X - open hole
Z - other (explain in remarks)

This field is mandatory and the openings entry will not be accepted if this field is not completed.

TYPE OF OPENING MATERIAL (C86/SCREEN-MATERIAL): Enter the code indicating the type of material from which the screen or other open section is made. The codes and their meanings are:

B - brass or bronze
C - concrete
G - galvanized iron
I - wrought iron
M - other metal
P - PVC, fiberglass, or other plastic
R - stainless steel
S - steel
T - tile
Z - other (explain in remarks)

DIAMETER OF OPEN SECTION (87/OPEN-DIAMETER): Enter the diameter, in inches, of whichever applies; the hole, if the well is finished open-hole, the nominal diameter of perforated or slotted pipe, or the nominal diameter of a screen.

WIDTH OF OPENING (C88/OPENING-WIDTH): Enter the short dimension of perforations or slots, or the nominal mesh size of screens, in inches.

LENGTH OF OPENING (C89/OPENING-LENGTH): Enter the long dimension of perforations or slots, in inches.

PRODUCTION DATA

Production data may be collected for both flowing or pumped sites. Very seldom will data for flowing and pumping conditions both be collected for the same site. Therefore, space has been provided on the schedule for entry of only one or the other. In the event data are collected at a flowing site during natural flow and also while being pumped (to increase discharge), enter the additional data on a separate schedule and attach.

R-VALUE PAIR: This is the only instance where the data collector must take action with regard to the R-Value Pair. Circle either 134 when natural flow data are reported, or 146 when pumped discharge data are reported. Note: The overwhelming majority of sites are non-flowing, therefore, pumped discharge will be more frequently reported. The data element identifiers used in the assignment value pairs are for pumped production. When flowing, 134, is circled the same identifiers are punched. The input system (edit program) will convert the identifiers to the appropriate flow data counterparts.

*ENTRY NO. (C147/PUMP-SEQ-NO): Each entry of production data for a site must have an identifying number in this space. The numbers do not have to be in sequence, but a number may be used only one time at a site. The entry number is mandatory; no production data will be stored if the number is missing.

DATE (C148/PUMP-MEAS-DATE): Enter the complete date on which the discharge data were determined. If the day and/or month are not known, enter 00 in the spaces. Use leading zeros for values of month or day less than 10, and specify all four digits of the year.

*DISCHARGE (C150/PUMP-DISCHARGE): Enter the discharge from the site in gallons per minute. If discharge is determined in other units (such as cfs or metric units), convert to gallons per minute. Two decimal places are provided for very small discharges. Discharge is a mandatory entry for production data; no production data will be stored if this field is missing or invalid.

SOURCE OF DATA (C151/PUMP-DISCHARGE-SOURCE): Enter the code for the source of the discharge data (who furnished the data). The codes are the same as those for Source of Depth Data (page B-27).

METHOD OF MEASUREMENT (C152/PUMP-DISCHARGE-METHOD): Circle the code for the method used to determine the discharge. The codes and their meanings are:

B - bailer

C - Current meter--either propeller-type meter in the discharge pipe, or propeller- or cup-type meter in the discharge channel.

E - estimated

F - flume

M - totaling meter

Ø - orifice

P - pitot-tube meter, includes Cox meter, Collins meter, and the like.

R - reported, method not known

T - trajectory method (free-fall method)

U - venturi meter

V - volumetric measurement; bucket or barrel and stopwatch

W - weir

Z - other

PRODUCTION LEVEL (C153/PUMP-PROD-LEVEL): Enter the water level, in feet below land surface, while the well was discharging. The difference between this value and the value for the next entry--static level-- will be the drawdown. If the discharge is by natural flow, the production level (if measureable) is the head above land surface during flow preceded by a minus sign (-).

STATIC LEVEL (C154/PUMP-STATIC-LEVEL): Enter the static water level, in feet below land surface. This may be the same value as the water level coded earlier, or the static water level measured at the start of a specific capacity test. If the static level is above land surface, enter the head above land surface (if measureable) preceded by a minus sign (-).

SPECIFIC CAPACITY (C272/PUMP-SPECIFIC-CAP): If the production and/or static levels are not known, but a specific capacity value is available, record that value in this field. Space is provided for recording precision to hundredths of a [(gal/min) / ft] drawdown.

SOURCE OF DATA (C155/PUMP-LEVEL-SOURCE): Enter the code for the source of the water-level data (who provided the information). The codes are the same as those used for the Source of Depth Data (page B-27).

METHOD OF MEASUREMENT (C156/PUMP-LEVEL-METHOD): Circle the code indicating the method by which the water levels were determined. The codes and their meanings are the same as those shown for "water level" (page B-27). If the static level and the production level were measured by different methods, record the method considered least accurate, to indicate the accuracy of the drawdown.

PUMPING PERIOD (C157/PUMP-PERIOD): Enter the length of time, in hours, that the well was pumped prior to the measurement of production level, that is, the duration of the specific capacity test. One decimal place is provided for times shorter than one hour.

LIFT DATA

If the site is equipped with a pump or other means of bringing water to the surface, information about the pump or lift is entered on this part of the schedule. If more than one means are available use separate schedules for each and attach them.

*TYPE OF LIFT (C43/LIFT-TYPE): Circle the code indicating the type of pump or lift. The codes and their meanings are:

A - air lift	R - rotary pump
B - bucket	S - submergible pump
C - centrifugal pump	T - turbine pump
J - jet pump	U - unknown
P - piston pump	Z - other (explain in remarks)

The type of lift is a mandatory entry for lift data; no lift data will be stored if this field is missing or invalid.

Air lift (A) is a type of lift in which a jet of air pumped below the water table causes a stream of mixed air and water to issue from the well.

Bucket (B) includes the familiar "rope and bucket", chain and bucket lifts, and the small bailer lifted by a rope or chain and pulley.

Centrifugal (C) pumps are of two types--horizontal and vertical, which merely refer to the axis about which the impellers rotate. Rotation of the impellers in a closed chamber creates a "suction" which draws the water into the pump. The water is then discharged from the pump, commonly under great pressure, by centrifugal force. Such pumps have maximum lift of about 25 feet but can force water to considerable heights above the pump. In some areas centrifugal pumps are placed on platforms a few feet above the water table to minimize the lift.

Jet (J) pumps are mainly used for relatively shallow wells although several companies manufacture a so-called "deep-well" jet. They are nearly always electrically powered and are easily recognized by two pipes extending from the pump into the well. One pipe forces water down the hole under pressure while the other pipe discharges water that has been forced to the surface by the action of the jet. Jet pumps are used principally for small water supplies, such as would be used for a suburban home, farm, or small commercial establishment.

Piston (P) pumps are of many types and include the familiar lift and pitcher pumps common in many rural areas. The old "reciprocating" pumps and the deep-well with walking-bean jacks are of the piston type.

Rotary (R) pumps may appear to resemble centrifugal pumps on casual inspection; however, they operate on the principle that direct pressure is created by squeezing the water between specially designed runners. A relatively high vacuum may be created on the intake side so the suction lift is comparable to that for centrifugal pumps.

A submergible (S) pump is a special type of turbine in which an electric motor is connected directly to the impellers and submerged beneath the water. It can be recognized by the presence of insulated electric wire leading into the well and the absence of any pump or power unit at the surface.

Turbines (T) are of several types and may be either for a deep or shallow well. A series of impellers, placed below the surface of the water, are rotated by a vertical shaft connected to a power source at the land surface. These impellers "pick up" the water and force it to the surface through the pump column. Such pumps are commonly used to lift large amounts of water at high pressure. They are used in large-supply wells for public, industrial, or irrigation supply. Power may be supplied by electric motors; gas, gasoline, steam, or diesel engines; tractors, or some other large-power unit.

Use unknown (U) only if the site is equipped with a pump about which other data are available, but the type of pump cannot be identified.

Other (Z). In this category should be placed any lifting device that does not belong in one of the major categories. Examples are: helical rotor, hydraulic ram, and siphon.

ENTRY NO. (C254/LIFT-ENTRY-NO): For sites where more than one lift device of the same type are installed, this entry is used to define uniqueness of the LIFT DATA entries. The numbers do not have to be in sequence, but each must be unique for that lift type for the site. This field is an optional control field in that it is not mandatory. If not specified the value will be assumed to be zero.

DATE OF DATA (C38/LIFT-DATE): Enter the complete date on which the lift data were collected. If the day or month are not known, enter 00 in the spaces. Use leading zeros for month or day less than 10 and specify all four digits for the year.

PUMP INTAKE SETTING (C44/INTAKE-SETTING): Enter the depth to the bottom of the pump bowls or intake, in feet below land surface. The value desired for this entry is the maximum distance the water level can be drawn down before the pump breaks suction.

TYPE OF POWER (C45/POWER-TYPE): Circle the code indicating the type of power used to power the pump. The codes and their meanings are:

D - diesel engine

E - electric motor

G - gasoline engine

H - hand

L - LP gas (propane or butane) engine

N - natural-gas engine

W - windmill

Z - other (explain in remarks)

HORSEPOWER (C46/HORSEPOWER): Enter the horsepower rating of the primary power source. Two decimal places are provided for small motors.

MAJOR PUMP DATA

For many ground-water sources, chiefly wells used for irrigation, water withdrawal is calculated from the engine power-consumption data. For such sites, additional data about the pump may be needed, and can be entered on this part of the schedule. Note: Only one major pump may be recorded for a given lift entry for the site.

*TYPE OF LIFT (C43/LIFT-TYPE): Enter the code indicating the type of pump that this group of information applies to. The codes given for type of lift under LIFT DATA above. Although this entry may seem redundant, it is essential for defining appropriate relationships. Type of lift is a mandatory entry for major-pump data; no data for the major pump will be stored if this field is missing or invalid.

MANUFACTURER OF PUMP (C48/MANUFACTURER): Enter the name of the company that manufactured the pump. Use meaningful abbreviations or acronyms if needed to fit the space.

SERIAL NUMBER OF PUMP (C49/SERIAL-NUMBER): Enter the serial number of the pump.

NAME OF POWER COMPANY (C50/POWER-COMPANY): Enter the name of the company that furnished electricity, natural gas, or other fuel for the pump. Use meaningful abbreviations if needed to fit the space.

POWER COMPANY ACCOUNT NO. (C51/ACCOUNT): Enter the account number under which the power company stores information on power consumption at the site.

POWER METER NO. (C52/METER): Enter the meter number of the electric or gas meter which records the power consumption of the pump.

PUMP RATING (C53/CONSUMPTION): Enter the "rating" of the pump, that is, the volume of water lifted per unit of power consumed. The value should be expressed as millions of gallons of water per kilowatt-hour of electricity, cubic foot of natural gas, gallon of liquid fuel or engine hour. The unit used will be defined by the type of power coded under LIFT DATA above. If the volume of water pumped is measured in other units (acre-feet or metric units), convert to millions of gallons recording on the schedule.

PERSON OR COMPANY WHO MAINTAINS THE PUMP (C54/PUMP-MAINTAINER): Enter the name of the person or company who is responsible for the maintenance of the pump, if known.

LIFT ENTRY NO. (C254/LIFT-ENTRY-NO): Enter the number assigned under "entry number" in "lift data." This number is needed to relate the

major pump data to the appropriate lift data entry when there is more thar one lift device of the same type at the site. If not specified the value is assumed to be zero.

ADDITIONAL LIFT (C255/ADDITIONAL-LIFT): Enter the additional head (above land surface datum) against which the pump works, in feet of water. For example, a sprinkler system for irrigation; the additional lift is the height of the sprinklers above LSD plus the pressure at the sprinklers (in feet of water).

RATED CAPACITY (C268/PUMP-CAPACITY): Enter the manufacturer's rating of the pump capacity, in gallons per minute.

STANDBY POWER DATA

Some municipal, industrial, and irrigation wells have an auxiliary source of power, in case the primary power source fails. Information about the standby power source can be entered on this part of the schedule.

*TYPE OF LIFT (C43/LIFT-TYPE): Enter the code indicating the type of pump which has the standby power unit; the codes are listed for type of lift under LIFT DATA above. Although the entry may be redundant it is mandatory; no data for standby power sources will be stored if this field is missing or invalid.

LIFT ENTRY NO. (C254/LIFT-ENTRY-NO): Enter the number assigned under "entry number" in "lift data." This number is needed to associate the standby power information to the appropriate lift data entry when there is more than one lift device of the same type at the site. If not specified, the value is assumed to be zero.

*TYPE OF POWER (C56/STANDBY-POWER-TYPE): Enter the code indicating the type of standby power available. The codes and their meanings are listed for type of power under LIFT DATA above. This field is mandatory; the standby horse power data will not be accepted without a valid value for this field.

HORSEPOWER (C57/STANDBY-HORSEPOWER): Record the horsepower rating of the standby power source.

AVAILABLE LOG DATA

Enter on this part of the schedule information about the types of geophysical or other logs available for the site. Space is provided for 4 log entries; if more logs are available, use additional forms.

*TYPE OF LOG (C199/LOG-TYPE): Enter the code for the type of log available. The codes and their meanings are:

A - drilling time	L - laterlog
B - casing collar	M - microlog
C - caliper	N - neutron
D - drillers	Ø - microlaterlog
E - electric	P - photographic
F - fluid-conductivity	Q - radioactive-tracer
G - geologists or sample	S - sonic
H - magnetic	T - temperature
I - induction	U - gamma-gamma
J - gamma ray	V - fluid velocity
K - dipmeter survey	Z - other (explain in remarks)

This field is the sole control field for the entry and is mandatory. Two entries cannot be submitted with same "Type of Log" value for a site.

BEGIN DEPTH (C200/LOG-TOP): Enter the depth to the top of the logged interval, in feet below land surface.

END DEPTH (C201/LOG-BOTTOM): Enter the depth to the bottom of the logged interval, in feet below land surface.

SOURCE OF DATA (C202/LOG-SOURCE): Enter the code for the source of the log data (who provided the information). The codes are the same as those used for the Source of Depth Data (page B-27).

WATER QUALITY DATA COLLECTION

If water-quality data have been collected at the site (other than one-time field data recorded in the section on field water quality) enter the appropriate data on this part of the form. If there are periods of significant interruption in the measurements or if the frequency of measurement changes, multiple entries of the data group may be reported to reflect the variations.

*BEGIN YEAR (C115/QN-BEGIN-YEAR): Enter the year in which the water quality data collection began at the site. Use 4 digits. Begin year is mandatory; no information about water-quality data collection will be stored if this field is missing or invalid.

END YEAR (C116/QN-END-YEAR): Enter the year in which the water-quality data collection was ended at the site. Use 4 digits. If the site is currently monitored, leave this field blank.

SOURCE AGENCY (C117/QN-DATA-SOURCE): Enter the code identifying the principal agency that analyzes water from the site. The codes are given in Appendix E.

FREQUENCY OF COLLECTION (C118/QN-FREQUENCY): Enter the code indicating frequency with which water-quality data are collected at the site. The codes and their meanings are:

A - annually	M - monthly
B - bimonthly (every 2 months)	Ø - one time only
C - continuously (recorder)	Q - quarterly
D - daily	S - semi-annually
F - semi-monthly (twice a month)	W - weekly
I - intermittently	Z - other (explain in remarks)

NETWORK SITE (C257/QN-NETWORK): Code 'Y' for "yes" in this field, if during the specified time period this site was a national water-quality data collection network station. Leave blank, if not. Note: Sites monitored for a project, whether local or national, does not constitute network participation.

GENERAL TYPE OF ANALYSES (C120/QN-ANALYSES-TYPE): Enter the code indicating the type of water-quality data generally collected at the site. The codes and their meanings are:

A - physical properties	C - trace elements
B - common ions	D - pesticides

E - nutrients

F - sanitary analysis (organisms)

G - pesticides and common ions

H - nutrients and common ions

J - sanitary analysis and common ions

K - pesticides and nutrients

L - trace elements, pesticides, and nutrients

M - all or most of the above

Z - other (explain in remarks)

WATER-LEVEL DATA COLLECTION

If periodic water-level data are or have been collected at the site, enter the appropriate information on this part of the form. If there are periods of significant interruption in the measurements or if the frequency of measurement changes, multiple entries of this data group may be reported to reflect the variations.

*BEGIN YEAR (C122/LN-BEGIN-YEAR): Enter the year in which water-level monitoring at the site began. Use 4 digits. Begin year is mandatory; no information about water-level data collection will be stored if this field is missing or invalid.

END YEAR (C123/LN-END-YEAR): Enter the last year in which water-level data were collected at the well. Use 4 digits. If water-level data are currently collected at the well, leave this field blank.

SOURCE AGENCY (C117/LN-DATA-SOURCE): Enter the code indicating the principal agency that collects water-level data at the site. The codes are listed in Appendix E.

FREQUENCY OF COLLECTION (C125/LN-FREQUENCY): Enter the code indicating the frequency with which water-level data are collected at the site. The codes are the same as for water-quality data.

NETWORK SITE (C258/LN-NETWORK): Code 'Y' in this field, if during the specified time period this site was designated part of a national water-level data collection network. Leave blank, if not. Note: Sites monitored for a project, whether local or national, does not constitute network participation.

WATER PUMPAGE/WITHDRAWAL DATA COLLECTION

If data on water withdrawal or water use are collected at the site, enter the appropriate information on this part of the form. If there are periods of significant interruption in the measurements or if the frequency of measurement changes, multiple entries of the data group may be reported to reflect the variations.

*BEGIN YEAR (C128/PN-BEGIN-YEAR): Enter the earliest year in which water-withdrawal data were collected at the site. Use 4 digits. Begin year is mandatory; no information about withdrawal data collection will be stored if this field is missing or invalid.

END YEAR (C129/PN-END-YEAR): Enter the last year in which water-withdrawal data were collected at the site. Use 4 digits. If water-withdrawal data are currently collected at the site, leave this field blank.

SOURCE AGENCY (C130/PN-DATA-SOURCE): Enter the code indicating the principal agency that collects water-withdrawal data at the site. The codes are listed in Appendix E.

FREQUENCY OF COLLECTION (C132/PN-FREQUENCY): Enter the code indicating the frequency with which water-withdrawal data are collected at the site. The codes are the same as for water-quality data.

NETWORK SITE (C259/PN-NETWORK): Code 'Y' in this field, if during the specified time period this site was designated part of a national water withdrawal data collection network. If not, leave blank. Note: Sites monitored for a project, whether local or national, does not constitute network participation.

METHOD OF COLLECTION (C133/PN-DATA-METHOD): Circle the code indicating the method by which water-withdrawal data are collected at the site. The codes and their meanings are:

C - calculated from power-consumption records

E - estimated

M - metered

U - unknown

Z - other (explain in remarks)

OTHER DATA AVAILABLE

Space is provided for showing the kind and location of other data pertinent to the site. Space is provided on the schedule for identification of two sets of data. Use another schedule for additional data.

*TYPE OF DATA (C181/DATA-TYPE): Enter the type of data that are available for the site. Use meaningful abbreviations if needed. This field is mandatory; if not provided no "Other Data" information will be stored.

LOCATION (C182/DATA-LOCATION): Circle the code that identifies the location of the data. The codes and their meanings are:

C - cooperator's office
D - district office (USGS only)
R - reporting agency office
Z - other (explain in remarks)

FORMAT (C261/DATA-FORMAT): Circle the code that best describes the form in which the data are stored. The codes and their meanings are:

F - files (raw data)
M - machine readable
P - published (report or basic-data release)
Z - other form (explain in remarks)

GEOHYDROLOGIC UNIT DESCRIPTIONS

This part of the form is used for recording geohydrologic data about the site. The form can be used to record only the principal aquifer or aquifers, all the significant log picks, or an entire log for the site. Each entry of this repeating group describes a lithologic interval, the interval is not necessarily an entire formation or an entire aquifer. Space is provided on the schedule for two units; if more space is required, use and attach additional forms.

*ENTRY NO. (C256/GEOHYDRO-NUMBER): Each geohydrologic unit described for a site must have a unique identifying number in this space. The numbers do not have to be in sequence, but each can be used only once for that site. The entry number is mandatory; no geohydrologic data will be stored if the value is missing or invalid.

DEPTH TO TOP (C91/GEOHYDRO-TOP): Enter the depth to the top of this lithologic unit, in feet below land surface.

DEPTH TO BOTTOM (C92/GEOHYDRO-BOTTOM): Enter the depth to the bottom of this lithologic unit, in feet below land surface. This field should be specified for all units except the last one in the hole.

*UNIT IDENTIFIER (C93/GEOHYDRO-UNIT): Enter the 8-character code identifying the formation or aquifer which includes this lithologic unit. Use the codes in the "Catalog of Aquifer Names and Geologic Unit Codes Used by the Water Resources Division." (The terms BASEMENT and BEDROCK will be accepted as legal values.) The unit identifier is mandatory; no data about the geohydrologic unit will be stored if this field is missing or invalid.

LITHOLOGY: Enter the code indicating the principal lithologic type of this lithologic unit. The codes and their meanings are:

Rock Term	Abbreviation
Alluvium	ALVM
Anhydrite	ANDR
Arkose	ARKS
Basalt	BSLT
Bentonite	BNTN
Breccia	BRCC
Calcite	CLCT
Chalk	CHLK
Clay	CLAY

Rock Term	Abbreviation
Claystone	CLSN
Coal	CØAL
Conglomerate	CGLM
Coquina	CQUN
Diorite	DØRT
Drift	DRFT
Evaporite	EVPR
Gabbro	GBBR
Glacial (undifferentiated)	GLCL
Gneiss	GNSS
Granite	GRNT
Gravel	GRVL
Graywacke	GRCK
Gypsum	GPSM
Igneous (undifferentiated)	IGNS
Lignite	LGNT
Limestone	LMSN
Loess	LØSS
Marl	MARL
Marlstone	MRLS
Metamorphis (undifferentiated)	MMPC
Mud	MUD
Mudstone	MDSN
Outwash	ØTSH
Quartzite	QRTZ
Rubble	RBBL
Sand	SAND
Sand and Gravel	SDGL
Sandstone	SNDS
Sandstone and Shale	SDSL
Saprolite	SPRL

Rock Term	Abbreviation
Schist	SCST
Sedimentary (undifferentiated)	SDMN
Shale	SHLE
Silt	SILT
Siltstone	SLSN
Slate	SLTE
Syenite	SYNT
Till	TILL
Travertine	TRVR
Tuff	TUFF
Volcanic (undifferentiated)	VLCC

LITHOLOGIC MODIFIER: Enter the adjective modifiers needed to describe the rock type. This field is free-form -- there are no assigned codes. Use meaningful abbreviations whenever possible. With the use of this field and the field for primary lithology, nearly any rock type can be described satisfactorily.

Examples: for soft, chalky grey limestone.

Lithology: LMSN, modifier: GREY, SOFT, CHALKY

or for a hard red sandstone, iron stained.

Lithology: SNDS, modifier: HARD, RED, FE STND

AQUIFER DATA

Space is provided for entering hydrologic data about each lithologic unit if such data are available.

*GEOHYDRO ENTRY NO. (C256/GEOHYDRO-NUMBER): Enter the identification number entered under "entry number" in "geohydrologic unit descriptions" above. This number is required to relate the aquifer data to the proper lithologic unit. The entry number is mandatory; no aquifer data will be stored without a valid value for this field.

*DATE (C95/AQUIFER-DATE): Enter the complete date on which the aquifer data were collected. If the month or day are not known, enter 00 in the spaces. Use leading zeros for month or day less than 10, and specify all four digits for the year. Date is a mandatory entry; no hydrologic data for the unit will be stored if this field is missing or invalid.

STATIC WATER LEVEL (C126/GEOHYDRO-STATIC-LEVEL): Enter the static water level in this lithologic unit, if known, in feet below land surface. If the water level is above land surface, enter the head above land surface preceded by a minus sign (-).

% WATER CONTRIBUTED (C132/GEOHYDRO-CONTRIBUTION): Enter the percentage of the total yield of the well that is contributed by this lithologic unit, if known. If part of the water that the well would otherwise produce is lost to this unit, enter the percentage of the water lost preceded by a minus sign (-). Note: If any lithologic unit is to be retrieved as a "principal aquifer", its water contribution must be at least 51 percent.

PERTINENT REMARKS

This space is provided for entering meaningful data for which no specific field is provided. Data in this field will be stored exactly as it is punched, together with the date on which it was entered. Use this space to explain entries of "other" for coded fields on the schedule, to describe the measuring point of observation wells, and for any other pertinent comments about the site. Space is provided for three comments of up to 40 characters each. Additional forms can be used if more space is needed. Note: Please keep the number of comments to a minimum and attempt to keep individual remarks within the 40 character limit.

Establish a local procedure for formatting remarks so that they may be more usable. For instance,

1. Start each remark with the number of the field or repeating group it relates to in the first three or four positions of its remark.

2. Follow this with the values which uniquely identify the appropriate repeating group occurrence, if applicable.

3. Continue the remark to subsequent entries, indenting several spaces on continuations to highlight remark beginnings.

PERTINENT REMARKS (1)

R = 183 * T = A *	185=	158 ACCK PETROL CO - OWNER	*
New Card Same R&T	185=	DUPE LAND DEU CO LEASES THE LAND	*
	185=	AND DRAWS WATER FROM THIS SITE	*

SPRING SCHEDULE
(Reference pages A-11 - A-12 of Appendix A)

GENERAL SPRING DATA

The first 22 entries on the spring schedule (SITE IDENT NO. THROUGH HYDROLOGIC UNIT) are identical to the first 22 entries on the site schedule, and the instructions on pages B-15 thru B-22 should be followed for all these entries except "Site Type." The site type code for springs is "S", and is pre-printed on the form.

USE OF WATER (C24/WATER-USE): Circle the code indicating the principal use of water from the spring. If water from the spring is used for more than one purpose, circle the principal use here and enter the subordinate uses in the fields 25 and 26. The codes and their meanings are on pages B-24 through B-26.

SECONDARY WATER USE (C25/SECONDARY-WATER-USE): If water from the spring is used for more than one purpose, show the secondary use here. Enter an appropriate code from the list.

TERTIARY WATER USE (C26/THIRD-WATER-USE): If needed, a third use can be shown here. Enter an appropriate code from the list.

SOURCE OF GEOHYDROLOGIC DATA (C36/GEOHYDRO-DATA-SOURCE): If geohydrologic data for the spring are coded later in the schedule, indicate here the source of data. If no geohydrologic information is available, leave the field blank. The codes and their meanings are:

A - another government agency. Do not use "A" if the reporting agency is the owner-use "Ø".

G - private geologist-consultant or University associate.

Ø - owner.

R - reported by a person other than the owner, another government agency, or a private geologist.

S - Reporting Agency Personnel - applies only to sites visited and examined by personnel on the staff of the agency submitting the data.

Z - other source.

OWNER IDENTIFICATION

Space is provided here for recording the ownership of the spring. If desired, this group can be repeated to keep a complete history of the ownership of the spring. Do not use this space to record the name of the spring; that information is entered at another place on the form. Instructions for completing the owner identification are given on page B-30.

OTHER SITE IDENTIFICATION NUMBERS

State agencies concerned with water rights frequently identify springs by permit number or some other numbering scheme. This field is provided for recording such numbers that may be useful in identifying the spring and correlating with the records of other persons. Space is provided on the schedule for two such extra identifiers; if more than two exist, enter them on another schedule and attach it to this schedule. Instructions for completing this information are given on page B-31.

OTHER DATA AVAILABLE

Space is provided for showing the kind and location of other data pertinent to the spring that is not stored in the data base. Instructions for completing this information are given on page B-56.

FIELD WATER QUALITY MEASUREMENTS

This space on the schedule is used to record the values of water-quality parameters collected on a "one-time" basis in the field when the spring is inventories. The results of laboratory analyses or repetitive field measurements should not be included here, but should be stored in the water quality or daily-values file. Instructions for completing this information are given on page B-33.

DISCHARGE DATA

*ENTRY NO. (C135/FLOW-SEQ-NO): Because more than one measurement of the discharge of a spring can be entered into the data base, each entry for a given spring must be uniquely identified by an entry number in this space. The entry numbers for a given spring do not have to be in sequence, but each must be unique for that spring. The entry number is mandatory; no discharge data will be stored if the number is missing.

DATE (C136/FLOW-MEAS-DATE): Enter the complete date on which the discharge was determined. If the day or month are not known, enter 00 in the spaces, and specify all four digits for the year.

*DISCHARGE (C138/FLOW-DISCHARGE): Enter the discharge of the spring, in gallons per minute. If discharge is determined in other units (such as CFS or metric units), convert to gallons per minute. Two decimal places are provided for very small discharges. This is a mandatory field.

SOURCE OF DATA (C139/FLOW-DISCHARGE-SOURCE): Enter the code for the source of the discharge data (who furnished the data). The codes are the same as those used for source of geohydrologic data (page B-63).

METHOD OF MEASUREMENT (C140/FLOW-DISCHARGE-METHOD): Circle the code for the method used to determine the discharge. The codes and their meanings are:

C - current meter--either propeller-type or cup-type meter in the discharge channel.

E - estimated.

F - flume.

M - totaling meter.

Ø - submerged orifice.

R - reported-method not known

U - venturi meter

V - volumetric measurement--bucket or barrel and stopwatch

W - weir

Z - other (explain in remarks).

OTHER SPRING DATA

NAME (C172/SPRING-NAME): If the spring has a name by which it is known locally, enter the name here. Space is provided for up to 20 characters; if the name is longer use meaningful abbreviations. Use of the last eight positions of this field (the shaded area) will cause an overflow as discussed on page B-12. Whenever possible avoid use of the shaded spaces.

TYPE OF SPRING (C173/SPRING-TYPE): Circle the code indicating the type of spring. The codes and their meanings are:

A - artesian
B - perched & contact
C - contact
D - depression
E - perched & depression
F - fracture
G - geyser
H - perched & tubular
J - artesian & depression
K - artesian & seepage or filtration
L - fracture & depression
P - perched
Q - perched & fracture
R - perched & seepage or filtration
S - seepage or filtration
T - tubular - cave
Z - other

Figure 5 illustrates the principal types of springs.

Springs issuing from deep fractures or associated with volcanism are considered special types of fracture springs. Geyser is recognized as a special type of fracture spring. Because of the character of its discharge it also may be recognized as a periodic spring. However, because of its special and unusual features, it is provided a separate code.

PERMANENCE (C174/PERMANENCE): Circle the code indicating the permanence of the spring. The codes and their meanings are:

E - periodic - ebb & flow
G - geyser
I - intermittent
P - perennial
R - response to precipitation
S - seasonal
Z - other

Perennial (P) refers to springs that discharge continuously.

Intermittent (I) refers to springs that discharge only during certain periods but at other times are dry.

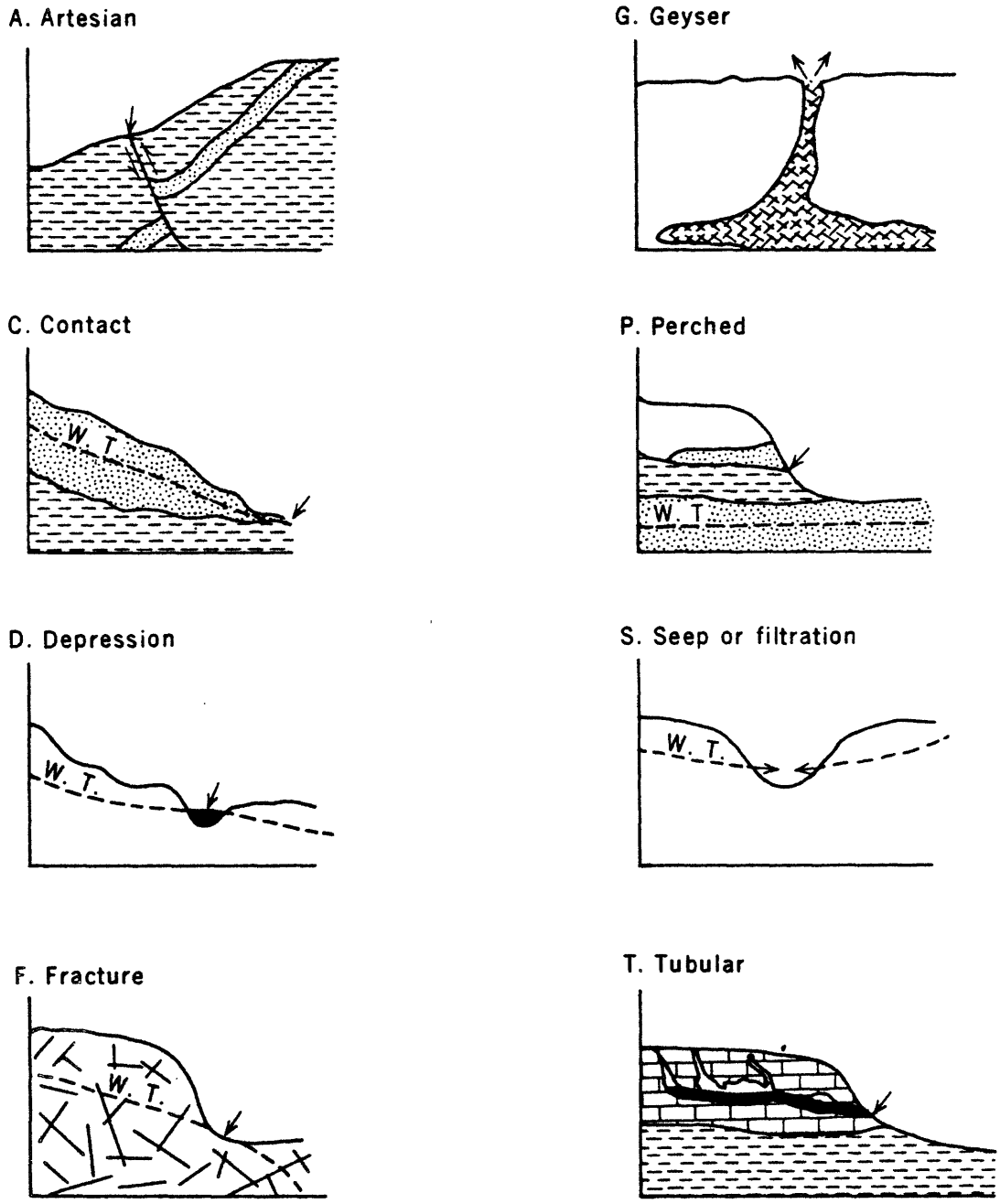

FIGURE 5: Sketch showing principal types of springs

Although the two main categories may be considered to be perennial and intermittent, more descriptive detail is deemed pertinent for intermittent springs. If sufficient detail is not available to describe the type of intermittent spring, the main category "intermittent" should be used.

The following characteristics describe some of the special types of intermittent springs:

Response to precipitation (R) refers to those springs which are recognized as existing after a period of rainfall; other times they are dry.

Seasonal (S) refers to those springs that exist only in a period of high water levels which in most areas is during the winter and early spring.

Geyser (G) refers to an intermittent spring in which discharge is caused at more or less regular and frequent intervals by expansive force of highly heated steam.

Periodic - Ebb & Flow (E) refers to springs that normally have periods of relatively greater discharge at regular and frequent intervals. Periodic springs may be perennial or intermittent. Periodic springs resemble geysers somewhat in their rhythmic action but are due to an entirely different cause. All or nearly all occur in areas underlain by limestone and their rhythmic action has been supposed to be due to natural sipons in the rock.

SPHERE OF DISCHARGE (C175/DISCHARGE-SPHERE): Circle the code indicating the sphere into which the spring discharges. The codes and their meanings are:

A - subaerial

W - subaqueous

IMPROVEMENTS (C176/IMPROVEMENTS): Circle the code indicating the type of improvements that have been constructed at or in association with the spring. The codes and their meanings are:

B - boxed or small covered basin

C - concrete basin

G - gallery

H - spring house

L - lined

N - none

P - pond

R - pipe (not for conduction of water from spring)

T - trough

Z - other (explain in remarks)

NUMBER OF OPENINGS (C177/NUMBER-SPRING-OPENINGS): Enter the number of openings through which water discharges from the spring. If the openings are too numerous to count, enter a value of 999.

FLOW VARIABILITY (C178/FLOW-VARIABILITY): Enter the variability of the spring, in percent, as expressed by the formula:

$$V = 100 \frac{a-b}{c} \text{ where}$$

V = variability, in percent,

a = maximum discharge,

b = minimum discharge,

c = average discharge;

if sufficient data are available to calculate or estimate the variability adequately.

BASIS FOR VARIABILITY (C179/FLOW-VAR-ACCURACY): Circle the code indicating the basis on which the variability of the spring was determined. The codes and their meanings are:

A - calculated from less than one year of continuous discharge records

B - calculated from 1 to 5 years of continuous discharge records

C - calculated from more than 5 years of continuous discharge records

D - calculated from intermittent measurements made over a period of more than 1 year

E - calculated from less than 1 year of record, or estimated

Z - determined by other method (explain in remarks)

GEOHYDROLOGIC UNIT DESCRIPTIONS

This part of the form is used for recording data about the geohydrologic unit from which the spring flows. Space is provided for only a single unit and only one per spring is permitted by the system. If more extensive geohydrologic data are available in the vicinity of the spring, as from an outcrop or test hole, use an appropriate schedule to describe the site from which the geohydrologic data are obtained and enter a suitable cross-reference in "remarks."

*UNIT IDENTIFIER (C93/GEOHYDRO-UNIT): Enter the 8-character code identifying the formation or aquifer which includes this lithologic unit. Use the codes in the "Catalog of Aquifer Names and Geologic Unit Codes Used by the Water Resources Division." This field is mandatory.

LITHOLOGY (C96-LITHOLOGY): Enter the code describing the principal lithology of this unit. The codes and their meanings are listed on pages B-57 thru B-59.

LITHOLOGIC MODIFIER (C97/LITH-MODIFIER): Enter the modifiers needed to describe the rock type. Details for completing this field are given on page B-59.

SITE VISIT DATA

This space is used to record the date of the inventory of or visits to the spring and the name of the person who made the inventory or visit. Instructions for completing this information are given on page B-32.

PERTINENT REMARKS

This space is provided for entering meaningful data for which no specific field is provided. Data in this field will be stored exactly as it is punched, together with the date on which it was entered into the data base. Use this space to explain entries of "other" for coded fields on the schedule and for other pertinent comments about the spring. Space is provided for three comments of up to 40 characters each; additional forms can be used if more space is needed.

See discussion under Site Schedule, page B-61.

WATER QUALITY DATA COLLECTION

If water-quality data (other than the one-time field data recorded elsewhere on the form) are collected at the spring, enter the appropriate information on this part of the form. Instructions for completing this information are given on pages B-52 and B-53.

WATER WITHDRAWAL DATA

If data on water withdrawal (water use) are collected at the spring, enter the appropriate information here. Instructions for completing this information are given on page B-55.

LITHOLOGIC DATA SCHEDULE
(Reference pages A-13 - A-14 of Appendix A)

GENERAL DATA FOR LITHOLOGIC SECTIONS

The first 22 entries on the lithologic data schedule are identical to the first 22 entries on the site schedule, and the instructions on pages B-15 thru B-22 should be followed for all these entries except site types.

Three site types are allowed for this schedule:

E - excavation

Ø - outcrop

W - well

SOURCE OF GEOHYDROLOGIC DATA (C361 GEOHYDRO-DATA-SOURCE): Circle the code indicating the source of data. The codes and their meanings are:

A - another government agency. Do not use "A" if the reporting agency is the owner; use "Ø".

G - private geologist-consultant or University associate.

Ø - owner

R - reported by person other than the owner, another government agency, or a private geologist.

S - Reporting Agency Personnel - applies only to sites visited and examined by personnel on the staff of the agency submitting the data.

Z - other source

GEOHYDROLOGIC UNIT DESCRIPTIONS

This part of the form is used for recording a lithologic section or well log. The form can be used to record either the principal units or a detailed section or log. Space is provided on the schedule for eight units; if more space is required, use and attach another form. Information on each lithologic unit is recorded exactly as on the site schedule, as described on page B-57. Note that the depths to the top and bottom of each unit are depths measured below the land surface or below the top of the outcrop. Although this direction of measurement is contrary to the usual practice for outcrops (outcrops are generally described up from the bottom) it is necessary in order to fit a system designed primarily for well data.

FORMATION HYDRAULICS
(Reference page A-15 of Appendix A)

This form is provided for entering data on formation hydraulics at the site. The same form is used for all hydrologic sites. Formation hydraulics data is on a separate form because of the absence of this kind of data for most sites.

*SITE IDENT NO. (C1/SITE-ID): Enter the 15-digit identification number of the site to which these hydraulic data apply. If a site schedule or spring schedule for the site has not been entered into the data base, an appropriate site or spring schedule must accompany this schedule. No data on formation hydraulics will be stored unless the mandatory location data for the site accompany the hydraulics data or are already in the file.

HYDRAULIC TEST DATA

This part of the form is used to provide information about the geohydrologic unit to which the formation hydraulics data apply and the means by which the data were obtained.

*ENTRY NO. (C99/HYDRAULIC-SEQ-NO): Enter a sequence number that uniquely identifies this set of test information for the site. If data are available from more than one test at the site, information about each test must be entered on a separate form and with a different entry number. The numbers need not be in sequence, but each must be unique for the site. Entry number is mandatory; no data on formation hydraulics will be stored if this field is missing or invalid.

*GEOHYDROLOGIC UNIT TESTED (C100/HYDRAULIC-UNIT-ID): Enter the 8-character code for the geohydrologic unit to which the formation hydraulics data apply. Use the codes given in the "Catalog of Aquifer Names and Geologic Unit Codes Used by the Water Resources Division." This field is mandatory; no hydraulic data will be entered without a value for the field.

DEPTH TO TOP TO TESTED INTERVAL (C101/TEST-INTERVAL-TOP): If a specific, identifiable interval of the formation has been isolated and tested, enter the depth to the top of the interval, in feet below land surface.

DEPTH TO BOTTOM (C102/TEST-INTERVAL-BOTTOM): Enter the depth to the bottom of the tested interval, in feet below land surface.

*UNIT CHARACTER (C103/HYDRAULIC-UNIT-TYPE): Circle the code indicating the hydraulic character of the unit tested. The codes and their meanings are:

A - Aquifer

C - Confining layer

This entry is mandatory; no hydraulic data will be entered if this value is not specified.

REMARK OR COMMENT (C104/HYDRAULIC-REMARKS): Briefly describe the means by which the formation hydraulics data were determined. Forty characters are allowed; use meaningful abbreviations. Examples:

"Distance-drawdown, 3 wells, theis soln"

"Specific-capacity test"

"Recovery, straight-line soln"

COEFFICIENTS

Use this part of the form to record the hydraulic coefficients determined by the tests. Space is provided for 10 sets of coefficients--one for each of observation sites plus one for the producing site. If more space is needed, use and attach another form.

*TEST ENTRY NO. (C99/HYDRAULIC-SEQ-NO): Enter the value assigned under "entry number" above. This field is needed to relate coefficients to a specific set of test information and must be repeated here. Test entry number is mandatory; no coefficients will be stored if this field is missing or invalid.

*RESULTS ENTRY NO. (C106/COEFFICIENTS-SEQ-NO): Number the sets of coefficients sequentially in this space. Each number must be unique within the set of data applicable to a given test. Results entry number is mandatory; no coefficients will be stored if this field is missing or invalid.

TRANSMISSIVITY (C107/TRANSMISSIVITY): Enter the value of transmissivity (t), in ft^2/day.

HORIZ. CONDUCTIVITY (C108/HORIZONTAL-CONDUCTIVITY): Enter the value of horizontal Hydraulic Conductivity (K), in ft/day.

VERT. CONDUCTIVITY (C109/VERTICAL-CONDUCTIVITY): Enter the value of vertical Hydraulic Conductivity (K_z), in ft/day.

STORAGE COEFFICIENT (C110/STORAGE-COEFFICIENT): Enter the storage coefficient or specific yield, (S).

LEAKANCE (C111/LEAKANCE): Enter the coefficient of leakance (L).

DIFFUSIVITY (C112/DIFFUSIVITY): Enter the hydraulic diffusivity ($\frac{T}{S}$).

SPECIFIC STORAGE (C113/SPECIFIC-STORAGE): Storage coefficient per vertical unit of thickness.

BAROMETRIC EFFICIENCY (C271/BAROMETRIC-EFFICIENCY): The efficiency of the aquifer's response to barometric changes expressed as percent. This parameter has been omitted from the form, but it may be coded and entered.

MISCELLANEOUS DATA SCHEDULE
(Reference page A-16 of Appendix A)

COOPERATOR DATA

Data needed by cooperating state agencies, especially regulatory agencies, can be entered in this part of the form.

COOPERATOR'S SITE IDENTIFIER (C213/COOPERATORS-ID): Enter other identification number used by the cooperating agency for the site, if different from the local well number. Space is provided for up to 10 characters.

REGISTRATION NO. (C214/CONTRACTOR-REGISTRATION-NO): Enter the registration or license number of the individual or firm that constructed the well or other type of site. Space is provided for up to 7 characters.

INSPECTION STATUS (C215/INSPECTION-STATUS): Enter a code indicating whether or not the site has been inspected and approved. Each cooperator can create his own set of meaningful codes, depending on the requirements of his agency. Space is provided for 2 characters.

REASON UNAPPROVED (C216/REASON-UNAPPROVED): Enter a code indicating the reason why an inspected and unapproved site was not approved. Each cooperator can create his own set of meaningful codes, depending on the requirements of his agency. Space is provided for 1 character.

INSPECTION DATE (C217/DATE-INSPECTED): Enter the complete date on which the site was inspected by cooperator personnel. The date must be complete; use leading zeros for month and day less than 10 and use 4 digits for year.

REMARKS (C218/COOPERATOR-REMARKS): Enter any additional pertinent cooperator data. Space is provided for up to 25 characters; use meaningful abbreviations or cooperator-devised codes as needed.

DATA ON MINOR SITE REPAIRS

If a well or other water source is cleaned, deepened, re-lined, or other repairs made, information about the work can be entered on this part of the form. Judgement must be used to decide whether the work is a minor repair, to be entered here, or sufficiently major to warrant an entry under "Well Construction Information" (see page B-34). Space is provided for 2 sets of repair entries; if additional space is needed use and attach another form.

*ENTRY NO. (C165/REPAIR-SEQ-NO): Because a given site can have more than one repair job, a unique entry number must be assigned to each entry. The numbers need not be sequential, but each must be unique for the site. Entry number is mandatory; no information about the repair will be stored if this field is blank or invalid.

*NATURE OF WORK (C166/REPAIR-NATURE): Enter the code indicating the nature of the repair work. The codes and their meanings are:

B - blocked off
C - cleaned
D - deepened
I - pump intake lowered
L - liner installed
Ø - slotted or perforated
P - plugged back
S - screen replaced
Z - other

Nature of work is a mandatory entry, no repair data will be stored without a value for this field.

DATE COMPLETED (C167/REPAIR-DATE): Enter the complete date on which the repair work was completed. If the month and/or day are not known, enter "00" in the spaces. Use leading zeros for month and day less than 10, and use 4 digits for year.

CONTRACTOR (C169/REPAIR-CONTRACTOR): Enter the name of the individual or company that did the work. For company names, use meaningful abbreviations or acronyms, if needed to fit the space provided.

% PERFORMANCE CHANGE (C170/PERFORMANCE-CHANGES): Enter the percentage by which the well performance was changed as a result of the work. Use whole numbers only. If the performance was decreased, enter the value with a preceding minus sign (-).

DATA FOR MULTIPLE WELL GROUPS

For multiple well groups (defined on pages B-16) some additional data may be useful. Space is provided on this part of the form for such additional data.

NO. WELLS IN GROUP (C204/NUMBER-WELLS): Enter the number of wells that make up this well group.

DEEPEST DEPTH (C205/WG-DEEPEST): Enter the depth of the deepest well in the group, in feet below land surface.

SHALLOWEST DEPTH (C206/WG-SHALLOWEST): Enter the depth of the shallowest well in the group, in feet below land surface.

CONSTRUCTION METHOD (C207/WG-METHOD): Circle the code indicating the method by which the wells are constructed. The codes and their meanings are:

D - drilled
J - jetted
V - driven
W - drive-wash
Z - other

SIZE OF WELL FIELD (C262/WG-SIZE): Enter the mean diameter of the well field, in feet; that is, the diameter of the circle that will enclose the well group.

DATA FOR POND, TUNNEL, OR DRAIN SITES

For ponds, tunnels, and drains, some additional dimensional information is useful. That information can be entered on this part of the form.

LONGEST DIMENSION (C209/PTD-LENGTH): Enter whichever of the following is applicable (in feet): The length of a tunnel or drain, the longer dimension of a non-circular pond, or the diameter of a circular pond.

OTHER (WIDTH) DIMENSION (C210/PTD-WIDTH): Enter whichever of the following is applicable (in feet): The width of a drain or non-circular tunnel, the diameter of a circular tunnel, or the shorter dimension of a non-circular pond.

DEPTH (C211/PTD-DEPTH): Enter whichever of the following is applicable (in feet): The depth of a drain, the height of a non-circular tunnel, or the average depth of a pond.

ORIENTATION (C263/PTD-BEARING): Enter the orientation of a tunnel or drain or of the long dimension of a non-circular pond, in degrees bearing from due north. Bearings are read clockwise from north; east is 90, south is 180, west is 270, etc.

DIP (C264/PTD-DIP): Enter the dip of a tunnel in degrees above or below (-) the horizontal.

DATA FOR COLLECTOR WELLS

For collector or Ranney type wells, additional data about the horizontal screens or laterals is needed. Such data can be entered on this part of the form. Space is provided for 11 laterals, if more is needed use and attach another form.

*ENTRY NO. (C220/LATERAL-NO): For control purposes, each lateral at a given site must be assigned a unique entry number. The numbers need not be sequential, but each must be unique for the site. Entry number is mandatory; no information about the lateral will be stored if this field is missing or invalid. Start numbering clockwise starting with the northern-most lateral.

DEPTH OF LATERAL (C221/LATERAL-DEPTH): Enter the depth to the lateral, in feet below land surface.

LENGTH OF LATERAL (C222/LATERAL-LENGTH): Enter the length of the lateral, in feet.

DIAMETER OF LATERAL (C223/LATERAL-DIAMETER): Enter the diameter of the lateral, in inches.

SCREEN MESH (C224/LATERAL-MESH): Enter the nominal mesh of the lateral screen, in inches.

WATER LEVEL DATA SCHEDULE
(Reference Page A-17 of Appendix A)

This form provides for entry of water-level data for sites which are part of a network. Note: This data even though entered through the Ground Water Site Inventory input system is not stored in the main data base but rather in a separate secondary data base - WATER LEVELS. These entries can not be modified except as a complete replacement, that is, if T=M is specified, fields 235, 237, 238 and 239 must all be reentered.

*SITE IDENT NO. (C1/SITE-ID): Enter the 15-digit site identification number of the site to which the water levels apply. If a site schedule or spring schedule for the site has not been previously entered into the data base, the site or spring schedule must accompany this schedule. No data on water levels will be stored unless the mandatory location of data for the site accompanies the water level data or are already in the system.

*DATE (C235/WL-MEAS-DATE): Enter the date on which the water level was measured. Show month, day, and year in spaces provided. If the day and/or month are unknown, show then as 00. Use leading zeros for values of month and day that are less than 10, and specify all four digits for year. Note: Date is a control field, therefore, two entries with the same date will not be accepted. Furthermore if the date is known to the year only, only one entry for that year may be specified. This is a mandatory field.

*WATER LEVEL (C237/WL-MEASUREMENT): Enter the water level at the site, in feet below land surface. Precision can be carried to two decimal places. If the water level is above land surface, precede the value with a minus sign (-). If the site flows but the head is not known, the site is dry, or the level cannot be measured, leave this field blank and record the appropriate code under STATUS. With these three exceptions this field is mandatory.

*STATUS (C238/WL-REMARKS): Enter the code which best represents the status of the site at the time of the measurement. The possible codes and their meanings are listed under SITE-STATUS on page B-28 . This field is mandatory for the three exceptions listed under WATER LEVEL, above.

METHOD (C239/WL-MEAS-METHOD): Enter the code indicating how the water level was measured. The codes and their meanings are the same as for METHOD OF MEASUREMENT on page B-27.

WORK AREA: HOLD, CUT, and so forth, are provided as work areas for the hydrologist in determining the water level. These fields are not punched for entry into the system.

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

SECTION II.C. Special Input Procedures

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II.C. Special Input Procedures

Contents

SECTION II.C. SPECIAL INPUT PROCEDURES

INTRODUCTION

The previous section described the basic schedules used for the normal (initial) data collection and input functions for the Ground Water Data Bases. This section will address those special input functions which for the most part pertain to the maintenance of data previously submitted using the standard schedules. A new schedule is introduced: the Modifications Schedule (Form 9-1904C; see page A-18 of Appendix A).

This form can be used for any GW data maintenance task. The following specific functions will be discussed in this section.

- Correction of Values
- Addition of Values
- Deletion of Values
- Deletion of a Repeating Group
- Changing Control Field Values
- Overflow Values
- Continuations
- Miscellaneous Values
- Observation Well Headings

BASIC DESIGN OF THE MODIFICATIONS SCHEDULE

The design of the schedule follows the same principles used in the design of the standard schedules, namely:

- Space is provided for the one-time entry of the site identification number (upper left-hand corner);
- Space is provided for specifying the measurement system for the recorded data (upper right-hand corner);
- Each modification transaction consists of:
  - a repeating group identifier (R-Value Pair),
  - A transaction code (T-Value Pair),
  - unique occurrence identifiers (Control Field Value Pairs) as required; and,
  - value assignments (Assignment Value Pairs) as appropriate.

The main body of the schedule consists of an area where modification transactions are recorded. The section labeled "Modification Transactions" corresponds to the free form data portion (columns 20-80) of the standard GW input card. This area is pre-ruled for ease in coding the maintenance transactions.

The section labeled "Submission" may be used to maintain an historic log of when a modification was submitted, who was responsible for it, and whether it had been processed by the input system. The utilization of these columns is optional. It is strongly recommended, however, that they be used and that this schedule be filed along with the appropriate initial entry schedules.

WORD OF CAUTION OR WARNING

When making corrections or changes to values, it is important to recognize that certain sets of data elements within or across repeating groups are interrelated. For example, well depth can not be greater than the hole depth and the bottom of a casing section can not be below the hole depth.

CORRECTION OF DATA BASE VALUES

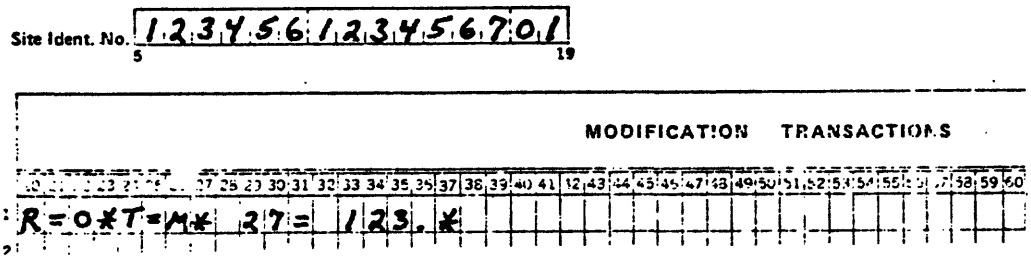
A value correction transaction consists of the following elements: A site identification number, a repeating group identifier (R-Value Pair), a transaction code of "M" (T-Value Pair), control values (Control Value Pairs), and data element corrections (Assignment Value Pairs). The number of control value pairs are directly related to the particular repeating group. That is, for certain repeating groups such as the logical entry, the site identification number is all that is required to uniquely identify the appropriate occurrence. In the case of hole construction data, however, the construction sequence number and the depth to the top of the hole segment are also required. By referencing the appropriate data collection schedule (in the latter case, the SITE SCHEDULE) and the appropriate portion of the schedule pertaining to that repeating group (page 2 for hole data), the required control fields can be identified by the pound signs (#) following their identifier numbers.

To enter a data value correction, the MODIFICATIONS SCHEDULE can be used. The site identification number is entered in the boxes located in the upper left hand corner of the form. Then starting with the first available line of the section labeled "Modification Transactions," record the appropriate R-Value Pair, T-Value Pair, Control Value Pairs (as required) and the necessary correction, - Assignment Value Pair(s).

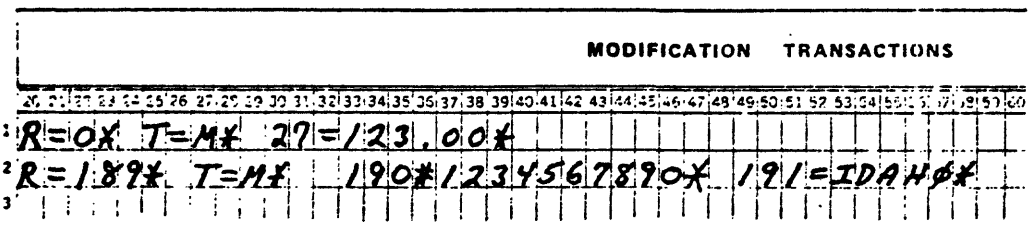
Note: Spacing between value pairs, or spacing preceeding or following delimiters or separators are ignored, except for those imbedded in a value (reference the discussion on NAME and TEXT data types in Section B).

Examples:

1. The hole depth for site 123456123456701 is to be changed to 123 feet below the land surface datum. The entry would be recorded as follows.

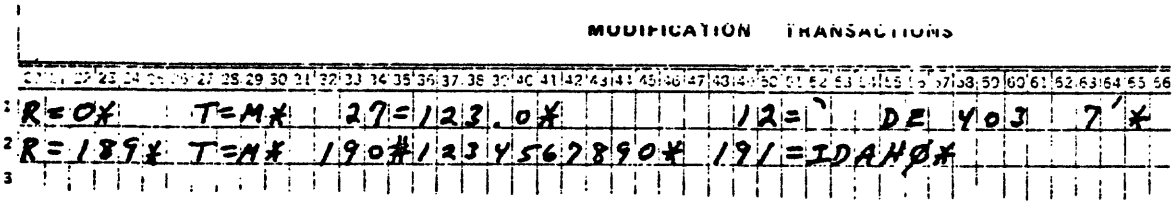


2. For the same site change the assigner of an "other identification number" to Idaho where the other id is 1234567890.



Note: 190 is the identifier of the control field and 191 is the identifier for the assigner.

3. In addition, change local number to ␣␣DE␣403␣␣7 (where ␣ means space or blank).



Note: The single quotes (') bounding the value for field 12 can be replaced by any other acceptable IBM EBCDIC character.
(The identifier used in the above examples was taken from page 1 of the Site Schedule, reference page A-7 of Appendix A).

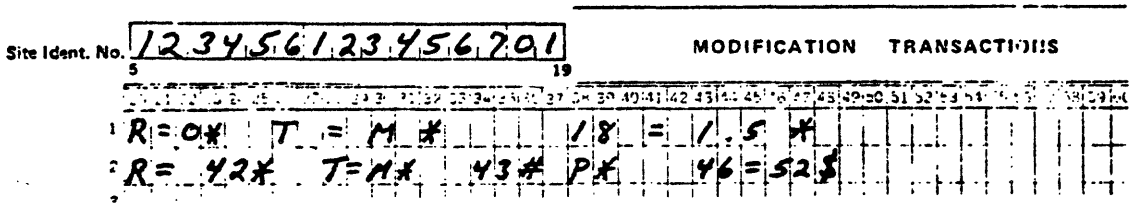
ADDITION OF VALUES TO THE DATA BASE

The addition of data element values to existing logical entries on repeating groups are handled in exactly the same manner as a value correction. There is no differentiation provided the entry exists. If it doesn't, then a new occurrence of the repeating group must be

added prior to the entry of the data element value. In this latter case, the transaction code becomes "A" in place of "M" and all the criteria for the entry of such a repeating group must be fulfilled.

Examples:

To site 123456123456701 add the accuracy of the altitude measurement as 1.5 feet. Also to a previously established lift repeating group representing the piston engine at the site, add the horsepower rating as 52.



DELETION OF DATA ELEMENT VALUES

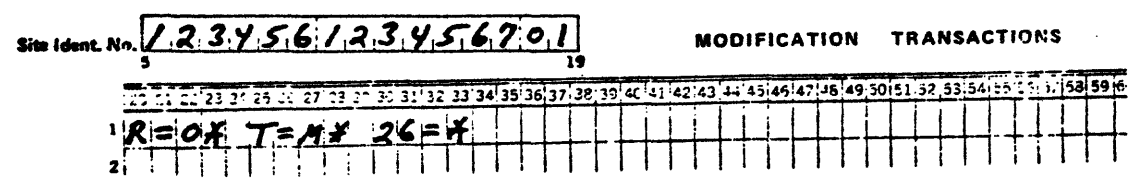
SYSTEM 2000 differentiates between a non-reported or "null" value and zero for numerics and spaces for name or text fields. This feature can be of significant importance to the GW Data Base user. If the feature were not available it would be difficult to distinguish between the case where the static water level was reported to be zero and when it wasn't reported at all.

If the user determines that a previously reported value is erroneous, yet he does not have a more accurate value, he may decide to remove the value entirely. This is done on the basis that it is better to have no value at all than to have an erroneous one.

To remove or delete a data element value, the transaction required is very nearly identical to that for correcting value. The difference is in the structure of the Assignment Value Pair. The equal sign separator is immediately followed by the value pair delimiter, that is =* with no intervening characters or spaces. This holds true for all data types except TEXT where the value segment must consist of two contiguous text delimiters followed by the value pair delimiter, that is, in terms of the standard text delimiters "*".

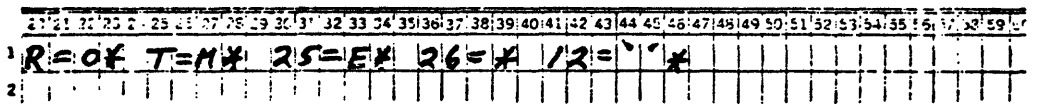
Examples:

1. Delete the tertiary water use for site 123456123456701.



2. Correct the secondary water use, delete the tertiary water use and delete local number.

MODIFICATION TRANSACTIONS



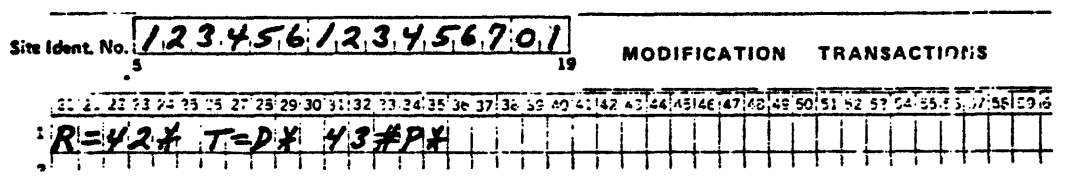
DELETION OF A REPEATING GROUP

Deletion of an entire Repeating group is accomplished via the transaction code value equal to "D." The basic transaction structure requirements for this type of transaction are: The site identification number, the repeating group identifier (R-Value Pair), the transaction code (T-Value Pair) equal to "D" and the appropriate control fields (Control Value Pairs).

Due to the hierarchical structure of the GW data base it is important that the user be aware of the effect of a repeating group delete. Specifically, the designated repeating groups and all lower level repeating groups related to that specific repeating group are deleted.

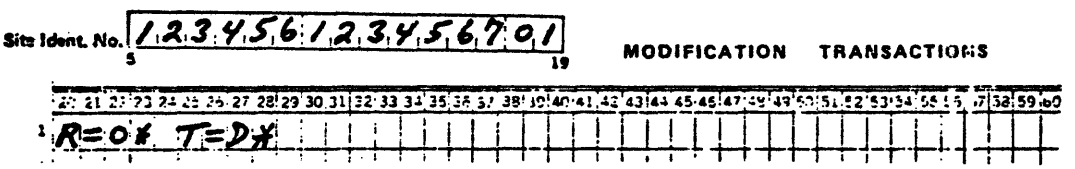
Examples:

1. Delete the piston engine lift data for site 123456123456701.



Note: This transaction will delete the specified repeating group plus all major pump and standby power groups related to it.

2. Delete site 123456123456701.



Note: This transaction will delete all data pertaining to the identified site. This includes all repeating groups at all levels of the hierarchy.

CHANGING CONTROL FIELD VALUES

On occasion, it may be necessary to change certain control field values. The "change of control field values" operation is permitted, but its use is discouraged. It is primarily available for those cases where considerable data have been entered under an erroneous control value. For example, in preparing the data for computer input, several digits of the site identification number were transposed; instead of being punched 35 they were punched 53. It would be too time consuming to delete the existing logical entry under the incorrect number and then to entirely reenter the data under the correct id. It could also result in introducing a host of new keypunch errors into the system requiring more time and effort to resolve. The change of control field values capability reduces the effort and possibility of introducing such errors.

The "change of control values" transaction consists of the following components: A site identification number, a repeating group identifier (R-Value Pair), a transaction code equal to M (T-Value Pair), the appropriate control fields (Control Value Pairs) and the appropriate data value changes (Assignment Value Pairs) for the changed control fields.

Note: The edit program sorts transactions so that:

1. all transactions against the same repeating group are brought together.
2. multiple transactions against the same repeating group are ordered by transaction type; deletes, adds, then modifies.
3. multiple transactions with the same transaction code against the same repeating group occurrence are ordered based on their physical order in the submission deck.

If one of the transactions changes a control value, later transactions processed must reference this new control value or they will be rejected for non-match. The potential for error is even more complex. If the new value for the control field sequentially precedes the old, all transactions referencing the new value will precede (due to the sort) the "change of control value" transaction. They will be processed first when a repeating group match can not be made, therefore, they will be rejected.

In order to guarantee proper processing, control field changes should be processed separately. Contact the Data Base Administrator for assistance.

Examples:

1. Change the site identification number for the entry from 123456123465701 to 123456123456701.

Site Ident. No. 1234561234567019

MODIFICATION TRANSACTIONS

1 R=0* T=M* 1=123456123456701*
2

2. Change the construction sequence number to 013 for the construction data entry whose current number is 095 and which belongs to site 456789123456719.

Site Ident. No. 4567891234567019

MODIFICATION TRANSACTIONS

1 R=58* T=M* 59≠95* 59=13*

OVERFLOW VALUES

As stated previously in the manual, there are instances where the user can store and subsequently retrieve values longer than the space reserved for them. This is provided as a standard feature of the SYSTEM 2000 software. It is, however, restricted to NAME and TEXT fields whose defined length is greater than three (3) characters. The GW data input system further limits this feature--an attempt to enter a value greater than 80 characters in length will result in the first 80 characters only being stored and the remainder being discarded without a warning.

The input forms are designed, in general, without regard to this feature. That is, data entry space is provided for only the number of characters specified in the data element's data base definition. For example, only 10 character boxes are allocated for "Project No." of the general site data portion of the Site Schedule (see page A-7 of Appendix A). This field was defined as a 10 position NAME data element to SYSTEM 2000, therefore, only 10 spaces were allocated on the input form.

There are a few data elements, though, where overflow space was allocated on the input schedules. The entry boxes reserved for this overflow are shaded. These shaded boxes can be used for longer values, but if at all possible, the user should attempt to utilize recognizable abbreviations or acronyms to avoid their use.

When the user can not avoid the use of the overflow feature and where sufficient space is not allocated on the standard input form for the value's entry, the special Modifications Schedule can be utilized. In order to enter an overlfow value, the user completes the transaction

entry as if it were a value correction, discussed above.

Note: It can not be overemphasized, the overflow feature, while it offers a very useful capability, is very expensive in terms of operating efficiency and data storage space. The user should make every effort to avoid overflow.

Examples:

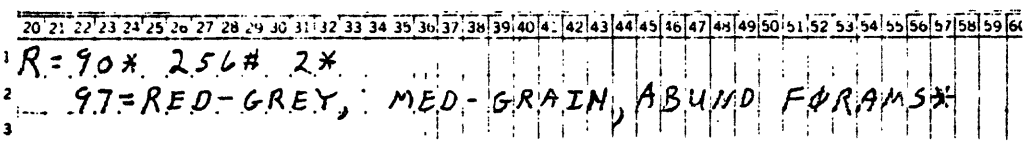
1. The "Susquehanna River District" map was used for determining the location of the site. This identification requires 26 characters to be completely entered as titled. The input schedule allocates 24 spaces, the last 4 of which are shaded indicating that overflow will result if they are used. Overflow can be avoided if the name is abbreviated as "Susquehanna R Dist."

2. If, however, the title of example 1 needed to be prefixed with the qualifier "upper," the abbreviated value would become "Up Susquehanna R Dist." This would result in overflow, but by using the shaded boxes the standard input form could be utilized.

3. The lithology of a geohydrologic unit is reddish-grey, medium grained limestone with abundant Foraminifera. The lithology would be recorded as "LMST," the approved abbreviation for limestone. The remainder of the description, however, even when abbreviated "Red-grey, med-grain, abund Forams" will not fit the 16 positions reserved for the lithologic modifier (see page A-13 of Appendix A).

The special Modifications Schedule could be used as shown, or the description must be further abbreviated.

MODIFICATION TRANSACTIONS



Note: 256 is the control field and the value, 2 designates the specific geohydrologic unit whose entry number is 2. Not shown is the site identification number which is also required.

CONTINUATIONS

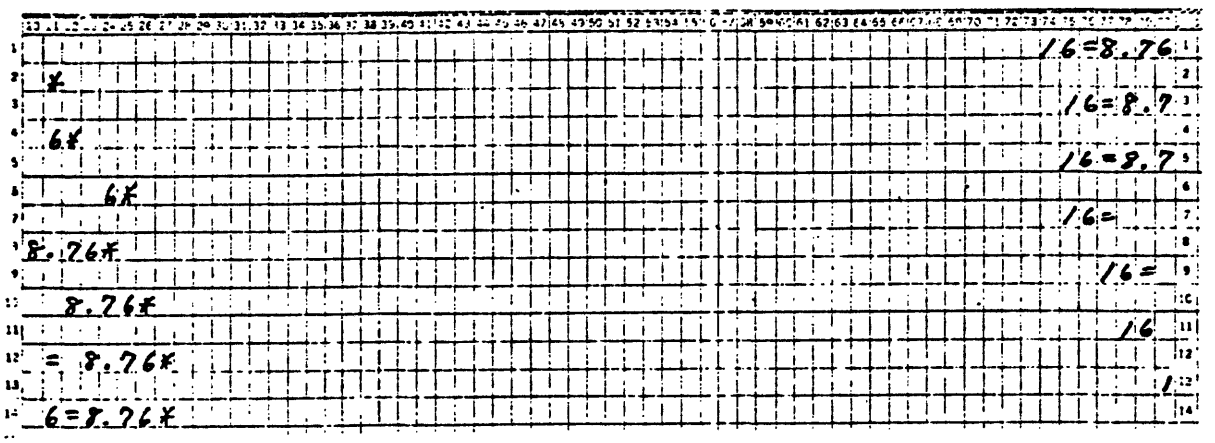
The portion of the schedule reserved for entering the modification transactions represents the free form area of the standard GW input card. This area corresponds directly to columns 20 through 80 of the card image. Column 20 of a card can be considered as the next contiguous column after column 80 of the previous card.

In this way data entries can be continued from one card to another. In fact numeric values continued from column 80 of one card to the next card do not have to begin in column 20 of the continuation card. All spaces preceeding the first continuation character are ignored.

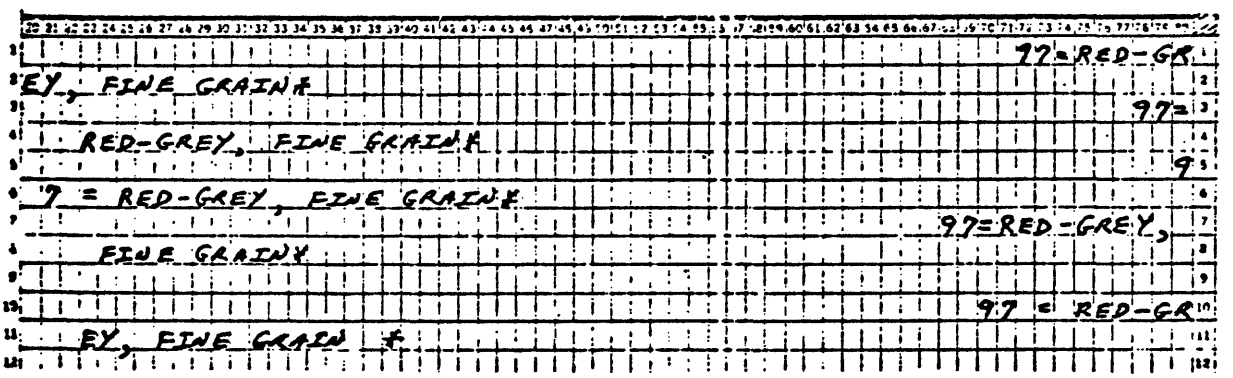
Note: All preceeding spaces on the continuation of a NAME (not TEXT) type data element are also ignored. If a space is desired it must occur on the previous card. Remember that more than one space at the end of the previous card will automatically be reduced to only one by SYSTEM 2000.

A value pair can be split across two cards at any point demonstrated below:

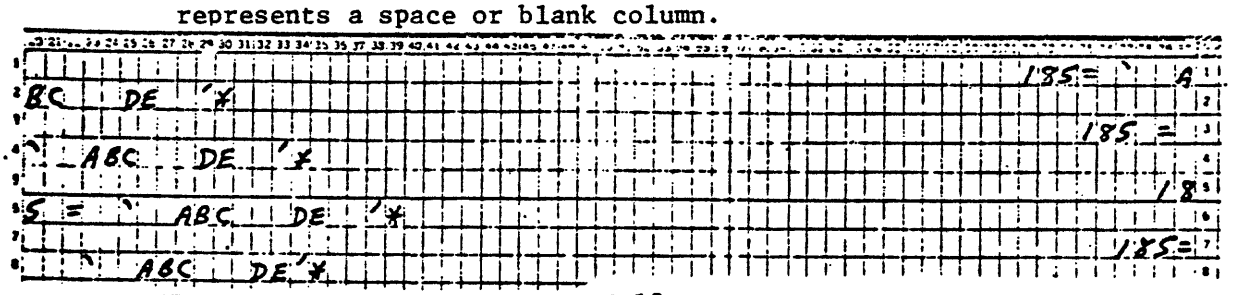
1. Continuing a numeric value pair: 16 = 8.76*



2. Continuing a NAME value pair: 97 = RED-GREY, FINE GRAIN



3. Continuing a TEXT value pair: 185 = 'ØØABCØØØDEØØ'* where Ø represents a space or blank column.



MISCELLANEOUS VALUES

For those users who desire to enter data which are not of national significance but which are essential to their operation, the "miscellaneous values" repeating group is available for just such local usage (the COOPERATOR DATA repeating group may also be considered such a group and is available for local use). Following is a description of the repeating group.

Note: This repeating group does not appear on any of the prepared schedules and all three fields are defined as "Key."

Only one entry per site is permitted.

R-Value Pair: The identifier for the repeating group is 250:

R = 250*.

T-Value Pair: Enter the appropriate transaction code.

COMPONENT ONE (C251/MISC-VALUE-1): This is a decimal component defined with the picture 9 (5).99. The value will not be edited except for format consistency.

COMPONENT TWO (C252/MISC-VALUE-2): This is a decimal component defined with the picture 9 (7).9(4). The value will not be edited except for format consistency.

COMPONENT THREE (C253/MISC-VALUE-3): This is a name type component defined with the picture X10. The value will not be edited except for format consistency. The field may not be overflowed.

OBSERVATION WELL HEADINGS

No schedule has been or is intended for entering well headings. However, a repeating group is available in the secondary data base, WATER LEVELS, for just such data. These headings will subsequently be used in producing tabular water level reports. The "MODIFICATION SCHEDULE" may be used for entering this data.

R-Value Pair: The identifier for the repeating group is 269:

R = 269*

T-Value Pair: Enter the appropriate transaction code for add (A) or delete (D). Note: The delete transaction will cause all entries for the site to be deleted, and the modify (M) code is not permitted.

Line of Heading (C270/HEADING-LINE): Enter for this field up to 100 characters of NAME data. The value will not be edited except to remove leading, redundant internal and trailing blanks. The value can not exceed 100 characters, but more than one entry can be made per site (no limit on the number of entries).

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

SECTION II.D. Key Punching

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

II.D. Key Punching

CONTENTS

ILLUSTRATIONS

SECTION II.D. KEY PUNCHING

The GWSI Schedules (Appendix A) are designed to be used both for recording data and for preparing it for computer input. Key punching is facilitated by the absence of fixed fields or specific card formats beyond card column 19. Card columns 1-19 are a fixed format; the remainder of each card is "free-form." Each data element on the forms is preceded by an identifier, which may be "R", "T", or a 1 to 3 digit number, and a separator, which may be "=" or "#". The data value is always followed by a delimiter, which may be either "*" or "$".

Card columns 1-19 comprise two fixed fields on every card. Columns 1-4 are reserved for a card sequence number. The sequence number is never coded on the forms; it is either generated by the key punch operator or pre-punched on otherwise blank cards. A program is available for pre-sequencing cards in quantities up to 9999 for a single application. The sole purpose of the card sequence number is convenience in handling the cards at the terminal and restoring order to a card deck that has been dropped or otherwise mixed-up, or in identifying cards to be changed. Use of the sequence number field is optional; the sequence numbers are checked by the input-edit program if they are present. No error message is generated if sequence numbers are absent, but numbers out of sequence generate warning messages.

Columns 5-19 on every card must contain the site identification number that is recorded as the first entry on every form. A card without a valid site-identification number in columns 5-19 will always be rejected by the input-edit program.

Columns 20-80 on each card are used for punching data. The data identifiers, separators, and delimiters are pre-printed on the forms and should be punched as they are printed (except for the asterisk "*" which can be replaced by a dollar sign "$"). The first entries on the site schedule are R = 0* and T = code* (where code may be A, D, M, or V); these fields should always be punched as the first entries on the first card for the form. The delimiter following each entry is printed as "*", however, if the key punch machine is in numeric shift, the character actually punched is "$", the "$" will be understood as a delimiter by the input-edit program. It is not necessary, therefore, to take the machine out of numeric shift to punch "*" after a string of numbers.

For all fields on the form following "T = code*", the form will be completed either by circling a pre-printed character or by writing data in the provided spaces. Only those fields that contain data (either circles, pre-printed or written) are punched. For each field that does contain data, the preceding number, the "=" or "#", the data, and the following "*" (or "$") are punched; fields that contain no data are

ignored by the keypuncher. If the data does not fill all the space allowed, do not leave spaces on the card, punch the "*" or "$" immediately after the data. Decimal points, where shown, must always be punched, and the pre-printed slashes in date fields must be punched when these fields contain an entry. Note: For a transaction code of "V" only the first line of the form (site ident. number, RG = 0* T = V*) is punched from the form.

Whenever a new value of "R = code*" appears on the form, a new card should be started. Note that an entry of "R = code*" must always be followed immediately on the card by an entry of "T = code*"; if "T = code*" is missing, all data is skipped to the next entry of "R = code*". The key punch operator may leave none, one or more spaces between data entries or before or after separators on the cards, and entries can be continued from column 80 of one card to column 20 of the next card if desired. Note that local number (12 = ' '*) and remarks (185 = ' '*) are special, and the enclosing single quote marks must be punched. The single quotes, however, can be replaced by the user with any legal character.

If temperature or conductance data are recorded (see page 1 of SITE and SPRING schedules) fields (196#00010* or 196#00095*) must be punched.

Note: Read the section titled "continuations" on page C-12.

Figures 6 and 7 show the first page of a completed site schedule and the corresponding punched cards. The cards are sequence numbered, and one space has been left between value pairs and separators, but neither or these practices are mandatory.

FORM NO. 9-1904-A

SITE NO.

Recorded by

U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
SITE SCHEDULE

Date

Check One ____ English ____ Metric Units

GENERAL SITE DATA (0)

Site Ident No (5–19) | RG Number R-0 | Transaction T- (A) D M V (add, delete, modify, verified)

Site-Type 2- C D H I M P T W (collector, drain, sinkhole, connector, multiple, pond, tunnel or, well shaft, well) | Data Reliability 3- (C) U L M (field checked, unchecked, location not accurate, minimal data) | Reporting Agency 4-

Project No. 5- | District 6- | State 7- | County (or town) | 8-

Latitude 9- (deg min sec) | Longitude 10- (deg min sec) | Lat-Long Accuracy 11- S F T M (sec, 5 sec, 10 sec, Min)

Local Number 12- | Land Net Loc. 13- (1/4 1/4 1/4 section, township, range, meridian)

Location Map 14- | Scale 15-

Altitude 16- | Method of Measurement 17- A L (M) (altimeter, level, map) | Accuracy 18-

Topo Setting 19- D C E F H K L Ø P S T U (V) W (depression, stream channel, dunes, flat, hilltop, sink, swamp, offshore, pediment, hillside, terrace, undulating, valley flat, upland draw) | Hydrologic Unit (OWDC) 20-

Date of First Construction/Completion 21- (month day year) | Use of Site 23- A D E G H Ø M P R S T U (W) X Z (anode, drain, geothermal, geo-seismic, heat reserv, observation, mine, oil or gas, recharge, repress, test, unused, withdrawal, waste, destroyed)

Use of Water 24- A B C D E F H (I) M N P R S T U Y Z (air cond., bottling, commercial, dewater, power, fire, domestic, irrigation, medicinal, industrial, public supply, recreation, stock, institution, unused, desal, other)

Secondary Water Use 25- | Tertiary Use of Water 26- | Depth of Hole 27- | Depth of Well 28- | Source of Depth Data ① 29-

Water Level 30- | Data Measured 31- (month day year) | Source ① 33-

Method of Measurement 34- A C E G H L M R (S) T V Z (airline, calibrated, estimated, pressure gage, calibrated, pressure gage, geophysical, logs, manometer, reported, steel tape, steel, electric tape, calibrated, electric tape, other)

Site Status 37- D F G H Ø P R S T V X Z (dry, flowing, nearby, flowing, nearby, recently flowing, obstruction, pumping, recently pumped, nearby, pumping, nearby, recently pumped, foreign substance, surface water effects, other)

Source of Geohydrologic Data ① 36- | Pump Used 35- (no) | Measuring Point 266- | Measuring Point Date 267- (month day year)

OWNER IDENTIFICATION (1)

R-158 | T- (A) D M (add, delete, modify) | Date of Ownership 159 # (month day year)

Name: Last 161- | First 162- | Middle Initial 163-

OTHER SITE IDENTIFICATION NUMBERS (1)

R-189 | T- (A) D M (add, delete, modify) | Ident 190 # | Assigner 191-

New Card Same R & T | Ident 190 # | Assigner 191-

SITE VISIT DATA (1)

R-186 | T- (A) D M (add, delete, modify) | Date of Visit 187# (month day year) | Name of Person 188-

FIELD WATER QUALITY MEASUREMENTS (1)

R-192 | T- (A) D M (add, delete, modify) | Date 193 # (month day year) | Geohydrologic Unit 195 #

New Card Same R thru 195

Temperature 196 # | Degrees C 197-

Conductance 196 # | µ Mhos 197-

Other (STORET) Parameter 196 # | Value 197-

Other (STORET) Parameter 196 # | Value 197-

FOOT NOTES:

① Source of Data Codes:

S D Ø A R L G Z (reporting agency, driller, owner, other gov't, other reported, logs, geologist, other)

FIGURE 6 - Part of a Completed Site Schedule

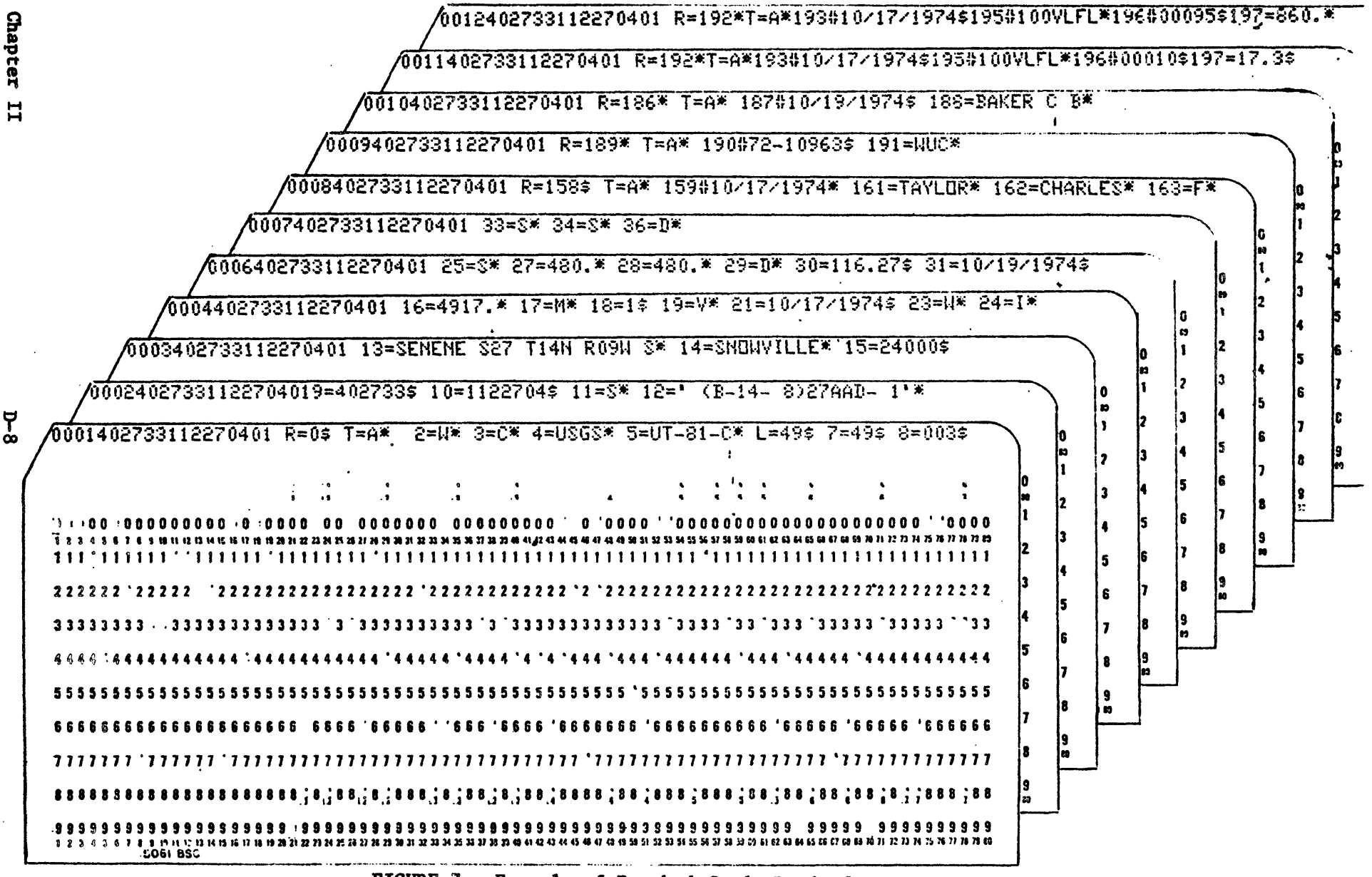


FIGURE 7 - Example of Punched Cards Ready for Input

APPENDIX E

AGENCY CODES

APPENDIX E
AGENCY CODES

The codes presented in this appendix are agency codes of recognized members of WATSTORE. Agency codes are assigned at the time an agency's request to use WATSTORE is approved. Additional information on requesting authorization to use WATSTORE and the assignment of agency codes is contained in Section I.A.1. of Volume 1 of the WATSTORE User's Guide. As new members are added to the list, this appendix will be updated and transmitted to all users of WATSTORE.

1. Federal Government Agencies

Agency Code	Agency
USGS	U.S. Geological Survey

2. State and Local Government Agencies

Agency Code	Agency
KY001	Kentucky Dept. of Natural Resources

A procedure is available to allow users to print all or a portion of the current WATSTORE Agency Codes. Several examples of the use of this procedure are given below.

```
Col. 1      Col. 12
•           •

//xxxxxxxx  JOB (----)
/*PROCLIB   WRD.PROCLIB
//  EXEC    LAGENCY
//  EXEC    LAGENCY,GROUP=US
//  EXEC    LAGENCY,GROUP=KY
```

This job would produce three listings of Agency Codes. The first EXEC card would cause all WATSTORE agency codes to be listed. The second EXEC card will produce a list of all agency codes that are related to federal agencies. The third EXEC card requests a list of all agency codes that have been assigned to the state of Kentucky. A listing of the agency codes assigned to any given state may be requested by setting the GROUP symbolic JCL parameter equal to the two character FIPS alphabetic state code.

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

Appendices A-E

CHAPTER II. INSTRUCTIONS FOR PREPARATION AND SUBMISSION OF GROUND-WATER DATA

II. Appendices A-E

ILLUSTRATIONS

APPENDIX A

Sample Input Schedules

FORM NO. SITE NO.

U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
SITE SCHEDULE

Recorded by _____ Date _____

Check One ____ English ____ Metric Units

GENERAL SITE DATA (0)

Site Ident No (5–15) | RG Number R=0 | Transaction T= A D M V (add, delete, modify, verified)

Site-Type 2= C D H I M P T W (collector, drain, sinkhole, connector, multiple, pond, tunnel or, well shaft; well) | Data Reliability 3= C U L M (field checked, unchecked, location not accurate, minimal data) | Reporting Agency 4=

Project No. 5= | District 6= | State 7= | County (or town) _____ | 8=

Latitude 9= (deg min sec) | Longitude 10= (deg min sec) | Lat-Long Accuracy 11= S F T M (sec, 5 sec, 10 sec, Min)

Local Number 12= | Land Net Loc. 13= (1/4 1/4 1/4 section, township, range, meridian)

Location Map 14= | Scale 15=

Altitude 16= | Method of Measurement 17= A L M (altimeter, level, map) | Accuracy 18=

Topo Setting 19= D C E F H K L Ø P S T U V W (depression, stream, dunes, flat, hilltop, sink, swamp, offshore, pediment, hillside, terrace, undulating, valley, upland flat draw; channel) | Hydrologic Unit (OWDC) 20=

Date of First Construction/ Completion 21= (month day year) | Use of Site 23= A D E G H Ø M P R S T U W X Z (anode, drain, geothermal, seismic, heat, observation, mine, oil or gas, recharge, repress, test, unused, withdrawal, waste, destroyed)

Use of Water 24= A B C D E F H I M N P R S T U Y Z (air cond., bottling, commercial, dewater, power, fire, domestic, irrigation, medicinal, industrial, public supply, recreation, stock, institution, unused, desal, other)

Secondary Water Use 25= | Tertiary Use of Water 26= | Depth of Hole 27= | Depth of Well 28= | Source of Depth Data ① 29=

Water Level 30= | Data Measured 31= (month day year) | Source ① 33=

Method of Measurement 34= A C E G H L M R S T V Z (airline, calibrated airline, estimated, pressure gage, calibrated pressure gage, geophysical logs, manometer, reported, steel tape, electric tape, calibrated electric tape, other)

Site Status 37= D F G H Ø P R S T V X Z (dry, flowing, nearby flowing, nearby recently flowing, obstruction, pumping, recently pumped, nearby pumping, nearby recently pumped, foreign substance, surface water effects, other)

Source of Geohydrologic Data ① 36= | Pump Used 35= (no) | Measuring Point 266= | Measuring Point Date 267= (month day year)

OWNER IDENTIFICATION (1)

R=158 | T= A D M (add, delete, modify) | Date of Ownership 159 # (month day year)

Name: Last 161= | First 162= | Middle Initial 163=

OTHER SITE IDENTIFICATION NUMBERS (1)

R=189 | T= A D M (add, delete, modify) | Ident 199 # | Assigner 191=

New Card Same R & T | Ident 190 # | Assigner 191=

SITE VISIT DATA (1)

R=196 | T= A D M (add, delete, modify) | Date of Visit 197# (month day year) | Name of Person 168=

FIELD WATER QUALITY MEASUREMENTS (1)

R=192 | T= A D M (add, delete, modify) | Date 193 # (month day year) | Geohydrologic Unit 195 #

New Card Same R thru 195

Temperature 196# 0,0,0,1,0 | Degrees C 197=

Conductance 196# 0,0,0,9,9,5 | µ Mhos 197=

Other (STORET) Parameter 196# | Value 197=

Other (STORET) Parameter 196# | Value 197=

FOOT NOTES:

① Source of Data Codes:

S D Ø A R L G Z (reporting agency, driller, owner, other gov't, other reported, logs, geologist, other)

WELL CONSTRUCTION DATA (1)

R = 58 * | T = A D M * (add, delete, modify) | Entry No 59 # * | Date of Construction Completion 60 = / / * (month / day / year) | Source of ① Const. Data 64 = *

Name of Contractor/Driller 63 = *

Method of Construction 65 = A B C D H J P R T V W Z *
(air-, rotary; bored, or augered; cable-, tool; dug; hydraulic, rotary; jetted; air-per-, cussion; reverse, rotary; trenching; driven; drive, wash; other)

Finish 66 = C F G H Ø P S T W X Z *
(porous, concrete; gravel w, perf; gravel, screen; horizontal, gallery; open, end; perforated, or slotted; screen; sand point; walled; open, hole; other)

Type of Seal 67 = B C G Z *
(bentonite; clay; cement, grout; other)

Bottom of Seal 68 = *

Method of Development 69 = A B C J N P S Z *
(air-lift, pump; bailed; compressed, air; jetted; none; other; surged, pump; other)

Number of Hours in Development 70 = *

Special Treatment During Development 71 = C D E F H M Z *
(chemicals, dry ice, explosives, deflocculent, hydrofracturing, mechanical, other)

DIMENSIONS OF THE HOLE CONSTRUCTED (2)

R = 72 * | T = A D M * (add, delete, modify) | Construction Entry No 59 # * | New Card for Each Hole Segment Same R, T & Field 59

Top of Hole Segment Below LSD	Bottom of Hole Segment below LSD	Diameter of Hole Segment
73 # *	74 = *	75 = *
73 # *	74 = *	75 = *
73 # *	74 = *	75 = *
73 # *	74 = *	75 = *
73 # *	74 = *	75 = *

CASING SCHEDULE (2)

R = 76 * | T = A D M * (add, delete, modify) | Construction Entry No 59 # * | New Card for Each Casing With Same R, T & Field 59

Top of Casing Segment Below LSD	Bottom of Casing Segment Below LSD	Diameter of Casing Segment	Casing Material ⑤	Thickness of Casing
77 # *	78 = *	79 # *	80 = *	81 = *
77 # *	78 = *	79 # *	80 = *	81 = *
77 # *	78 = *	79 # *	80 = *	81 = *
77 # *	78 = *	79 # *	80 = *	81 = *
77 # *	78 = *	79 # *	80 = *	81 = *

OPENINGS SCHEDULE (2)

R = 82 * | T = A D M * (add, delete, modify) | Construction Entry No 59 # * | New Card for Each Open Section With Same R, T and Field 59

	(Openings Data)	(Openings Data)	(Openings Data)
Top of Section Below LSD	83 # *	83 # *	83 # *
Bottom of Section Below LSD	84 = *	84 = *	84 = *
Type of Openings ⑥	85 = *	85 = *	85 = *
Type of Material ⑦	86 = *	86 = *	86 = *
Diameter of Open Section	87 = *	87 = *	87 = *
Width of Opening	88 = *	88 = *	88 = *
Length of Opening	89 = *	89 = *	89 = *

FOOT NOTES:

① Source of Data Codes:
S D Ø A R L G Z
(reporting agency; driller; owner; other gov't.; other reported; logs; geologist; other)

⑤ Casing Material Codes
B C G I M P R S T U W Z
(brick; concrete; galv. iron; wrought iron; other metal; PVC or plastic; rock or stone; steel; tile; coated steel; wood; other)

⑥ Type of Openings Codes
F L M P R S T W X Z
(fracture; louvered, shuttered; mash; perforated or slotted; wire-wound; screen (unknown); sand point; walled; open hole; other)

⑦ Type of Material Codes for Open Sections
B C G I M P R S T Z
(brass or bronze; concrete; galv. iron; wrought iron; other metal; PVC or plastic; stainless steel; steel; tile; other)

PRODUCTION DATA (1)

R= 134 146 * (flowing, pumped) | T= A D M * (add, delete, modify) | Entry No 147# * | Date 148= / / * (month day year)

Discharge: 150= * | Source of Data① 151= * | Method of Measurement 152= B C E F M O P R T U V W Z * (boiler, current meter, estimated, flume, totalizing meter, orifice, pitot-tube, reported, trajectory, venturi, volumetric, weir, other)

Production Level 153= * | Static Level 154= * | Source① of Data 155= * | Specific Capacity 272= * | Method of Measurement 156= A C E G H L M R S T V Z * (airline, calibrated, estimated, pressure, calibrated, geophysical, manometer, reported, steel, electric, calibrated, other) | Pumping Period 157= *

LIFT DATA (1)

R=42 * | T= A D M * (add, delete, modify) | Type of Lift 43# A B C J P R S T U Z * (air, bucket, centrifugal, jet, piston, rotary, submergible, turbine, unknown, other) | Entry No 254# *

Pump Intake Setting 44= * | Type of Power 45= D E G H L N W Z * (diesel, electric, gasoline, hand, LP gas, natural gas, windmill, other)

Date 38= / / * (month day year) | Horsepower 46= *

MAJOR PUMP DATA (2)

R=47 * | T= A D M * (add, delete, modify) | Type of Lift 43# * | Lift Entry No 254# * | Manufacturer of Pump 48= *

Serial No of Pump 46= * | Name of Power Company 56= *

Power Company Account No 51= * | Power Meter No 52= * | Pump Rating 53= *

Person or Company Who Maintains the Pump 54= * | Additional Lift 255= * | Rated Pump Capacity 268= *

STANDBY POWER DATA (2) (See LIFT DATA for codes of fields 43 and 56 below)

R=55 * | T= A D M * (add, delete, modify) | Type of Lift 43# * | Type of Power 58= * | Horsepower 57= * | Lift Entry No 254# *

AVAILABLE LOG DATA (1)

R=198 * | T= A D M * (add, delete, modify) | New Card for Each Log Type Same R & T

Type of Log②	Begin Depth	End Depth	Source of Data①
166# *	260= *	201= *	202= *
199# *	200= *	201= *	202= *
188# *	260= *	201= *	202= *
196# *	200= *	201= *	202= *

WATER QUALITY DATA COLLECTION (1)

R=114 * | T= A D M * (add, delete, modify) | Begin Year 115# * | End Year 116= * | Source Agency 117= *

Frequency of Collection③ 110= * | Network Site 257= * | Type of Analyses④ 120= *

WATER LEVEL DATA COLLECTION (1)

R=121 * | T= A D M * (add, delete, modify) | Begin Year 122# * | End Year 123= * | Source Agency 124= *

Frequency of Collection③ 125= * | Network Site 258= *

WATER PUMPAGE/WITHDRAWAL DATA COLLECTION (1)

R=127 * | T= A D M * (add, delete, modify) | Begin Year 128# * | End Year 126= * | Source Agency 130= *

Frequency of Collection③ 131= * | Network Site 258= * | Method of Collection 133= C E M Z * (calculated, estimated, metered, other)

OTHER DATA AVAILABLE (1)

R=100 * | T= A D M * (add, delete, modify) | Type of Data 181# * | Loc 182= C D Z * (cooperator, district, other) | Format 261= F M P Z * (files, machine, published, other readable)

New Card Same R & T | Type of Data 181# * | Loc 182= C D Z * | Format 261= F M P Z *

FOOT NOTES:

① Source of Data Codes:

S D Ø A R L G Z (reporting agency, driller, owner, other gov't, other reported, logs, geologist, other)

② Type of Log Codes

A B C D E F G H I J K L M N Ø P Q (time, caliper, caliper, driller's, electric, fluid conduct, geologist, magnetic, induction, gamma ray, dipmeter, lateralog, microlog, neutron, μ later, photo, radioactive)

S T U V Z (sonic, temp, gamma-gamma, fluid velocity, other)

③ Frequency of Collection Codes

A B C D F I M Ø Q S W Z (annual, bi-monthly, continuous, daily, semi monthly, intermittent, monthly, one time only, quarter annual, semi-annual, weekly, other)

④ Type of Quality Analyses Codes

A B C D E F G H J K L M Z (physical, common chemical, trace elements, pesticides, nutrients, sanitary, codes DBD, codes DBE, codes DBF, codes DBE, codes C,DBE, all or most, other)

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

R = 90 * | T = A D M * (add, delete, modify) | Entry No 256 # * | Depth to Top 91 = * | Depth to Bottom 92 = *

Unit Identifier 93 = * | Lithology 96 = * | Lithologic Modifier 97 = *

AQUIFER DATA (2)

R = 94 * | T = A D M * (add, delete, modify) | Geohydrologic Unit Entry No 256 # *

Date 95 # / / * (month / day / year) | Water Level 126 = * | % Water Contributed 132 = *

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

R = 90 * | T = A D M * (add, delete, modify) | Entry No 256 # * | Depth to Top 91 = * | Depth to Bottom 92 = *

Unit Identifier 93 = * | Lithology 96 = * | Lithologic Modifier 97 = *

AQUIFER DATA (2)

R = 94 * | T = A D M * (add, delete, modify) | Geohydrologic Unit Entry No 256 # *

Date 95 # / / * (month / day / year) | Water Level 126 = * | % Water Contributed 132 = *

PERTINENT REMARKS

R = 193 * | T = A * (add)

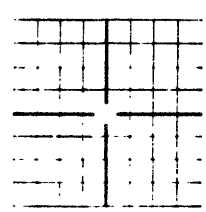
New Card Same R&T

195 = ' *

185 = ' *

186 = ' *

NOTES:



FORM NO. 9-1904-B

SPRING NO. _____

U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
SPRING SCHEDULE

Recorded by _____ Date _____

Check One ____ English ____ Metric Units

GENERAL SPRING DATA (0)

Site Ident No (5–19) | RG Number R=0 | Transaction T= A D M V (add, delete, modify, verified)

Site-Type 2= S | Data Reliability 3= C U L M (field checked, unchecked, location not, minimal) | Reporting Agency 4=

Project No. 5= | District 6= | State 7= | County (or town) _____ 8=

Latitude 9= (deg min sec) | Longitude 10= (deg min sec) | Lat-Long Accuracy 11= S F T M (sec, 5 sec, 10 sec, Min)

Local Number 12= | Land Net Loc. 13= (1/4 1/4 1/4 section, township, range, merid)

Location Map 14= | Scale 15=

Altitude 16= | Method of Measurement 17= A L M (altimeter, level, map) | Accuracy 18=

Topo Setting 19= D C E F H K L Ø P S T U V W (depression, stream channel, dunes, flat, hilltop, sink, swamp, offshore, pediment, hillside, terrace, undulating, valley flat, upland draw) | Hydrologic Unit (OWDC) 20=

Use of Water 24= A B C D E F H I M N P R S T U Y Z (air cond., bottling, commercial, dewater, power, fire, domestic, irrigation, medicinal, industrial, public supply, recreation, stock, institution, unused, desal, other)

Secondary Water Use 25= | Tertiary Use of Water 28=

Source of Geohydrologic Data ① 36=

OWNER IDENTIFICATION (1)

R=158 | T= A D M (add, delete, modify) | Date of Ownership 159 # (month day year)

Name: Last 161= | First 162= | Middle Initial 163=

OTHER SITE IDENTIFICATION NUMBERS (1)

R=169 | T= A D M (add, delete, modify) | Ident 190 # | Assigner 191=

New Card Same R & T | Ident 190 # | Assigner 191=

SITE VISIT DATA (1)

R=186 | T= A D M (add, delete, modify) | Date of Visit 187 # (month day year) | Name of Person 188=

FIELD WATER QUALITY MEASUREMENTS (1)

R=182 | T= A D M (add, delete, modify) | Date 193 # (month day year) | Geohydrologic Unit 195 #

New Card Same R thru 195

Temperature 196 # 0 0 0 1 0 | Degrees C 197=

Conductance 196 # 0 0 0 9 5 | µ Mhos 197=

Other (STORET) Parameter 196 # | Value 197=

Other (STORET) Parameter 196 # | Value 197=

DISCHARGE DATA (1)

R=134 | T= A D M (add, delete, modify) | Entry No 135 # | Date 136= (month day year)

Discharge 138= | Source of Data ① 139=

Method of Measurement 140= C E F M Ø R U V W Z (current meter, estimated, flume, tateling meter, orifice, reported, venturi meter, volumetric, weir, other)

FOOT NOTES:

① Source of Data Codes:

S D Ø A R L G Z (reporting agency, driller, owner, other gov't, other reported, logs, geologist, other)

OTHER SPRING DATA (1)

R = 171 * | T = A D M * (add, delete, modify) | Spring's Name 172 = *

Type of Spring 173 = A B C D E F G H J K L P Q R S T Z *
artesian, perched, contact; contact; depression; perched, depression; fracture; geyser; perched, tubular; artesian, depression; artesian, seepage; fracture, depression; perched; perched, fracture; perched seepage; seepage, filtration; tubular, cave; other

Permanence 174 = E G I P R S Z *
ebb & flow, geyser, intermittent, perennial, precip., seasonal, other

Sphere of Discharge 175 = A W *
Subaerial, Subaqueous

Improvements 176 = B C G H L N P R T Z *
boxed, basin; concrete, basin; gallery; spring, house; lined; none; pond; pipe; trough; other

Number of Openings 177 = *

Flow Variability 178 = *

Basis for Variability 179 = A B C D E Z *
one year, continuous; 1-5 years, continuous; over 5 years, continuous; over year, intermittent; less than, A-D; other

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

R = 90 * | T = A D M * (add, delete, modify)

Unit Identifier 93 = * | Lithology 96 = * | Lithologic Modifier 97 = *

WATER QUALITY DATA COLLECTION NETWORK PARTICIPATION (1)

R = 114 * | T = A D M * (add, delete, modify) | Begin Year 115 # * | End Year 116 = * | Source Agency 117 = *

Frequency of Collection ② 116 = * | Type of Analyses 120 = A B C D E F G H J K L M Z *
physical; common, chemical; trace, elements; pesticides; nutrients; sanitary; codes, B&D; codes, B&E; codes, B&F; codes, D&E; codes, C,D&E; all or, most; other

Network Site 257 = *

WATER PUMPAGE/WITHDRAWAL DATA COLLECTION NETWORK PARTICIPATION (1)

R = 127 * | T = A D M * (add, delete, modify) | Begin Year 128 # * | End Year 129 = * | Source Agency 130 = *

Frequency of Collection ② 131 = * | Method of Collection 133 = C E M Z * (calculated, estimated, metered, other) | Network Site 259 = *

OTHER DATA AVAILABLE (1)

R = 180 * | T = A D M * (add, delete, modify) | Type of Data 181 # * | Loc 182 = C D Z * (cooperator, district, other) | Format 261 = F M P Z * (files, machine, published, other readable)

New Card Same R & T | Type of Data 181 # * | Loc 182 = C D Z * | Format 261 = F M P Z *

PERTINENT REMARKS (1)

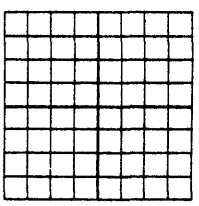
R = 183 * | T = A * | 186 = * | 185 = * | 185 = *

New Card Same R&T

FOOT NOTES:

② Frequency of Collection Codes

A B C D F I M Ø Q S W Z
annual; bi-monthly; continuous; daily; semi-monthly; intermittent; monthly; one time only; quarter, annual; semi-annual; weekly; other



Recorded by 9-1904-F

U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

LITHOLOGIC SCHEDULE

Date ____

Check One ___ English ___ Metric Units

GENERAL DATA FOR LITHOLOGIC SECTIONS

Site Ident No [ ] 9 ... 19 — RG Number [R=0 *] — Transaction [T= A D M V *] add, delete, modify, verified

Site-Type [2= E Ø *] excavation, outcrop — Data Reliability [3= C U L M *] field checked, unchecked, location not accurate, minimal data — Source Agency [4= *]

Project No. [5= *] — District [6= *] — State [7= *] — County (or town) ____ [8= *]

Latitude [9= *] deg min sec — Longitude [10= *] deg min sec — Lat-Long Accuracy [11= S F T M *] sec, 5 sec, 10 sec, Min

Local Number [12= *] — Land Net Loc. [13= 1/4 1/4 1/4 S T R *] section, township, range, merid

Location Map [14= *] — Scale [15= *]

Altitude [16= *] — Method of Measurement [17= A L M *] altimeter, level, map — Accuracy [18= *]

Topo Setting [19= D C E F H K L Ø P S T U V *] depression, stream channel, dunes, flat, hilltop, sink, swamp, offshore, pediment, hillside, terrace, undulating, valley flat — Hydrologic Unit (OWDC) [20= *]

Source of Geohydrologic Data [36= A D G L O R S Z *] other gov't, driller, geologist, logs, owner, reported, USGS, other

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

[R=90 *] [T= A D M *] add, delete, modify — Entry No [256 # *] — Depth to Top [91= *] — Depth to Bottom [92= *]

Unit Identifier [93= *] — Lithology [96= *] — Lithologic Modifier [97= *]

AQUIFER DATA (2)

[R=94 *] [T= A D M *] add, delete, modify — Geohydrologic Unit Entry No [256 # *]

Date [96 # / / *] month day year — Water Level [126= *] — % Water Contributed [132= *]

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

[R=90 *] [T= A D M *] add, delete, modify — Entry No [256 # *] — Depth to Top [91= *] — Depth to Bottom [92= *]

Unit Identifier [93= *] — Lithology [96= *] — Lithologic Modifier [97= *]

AQUIFER DATA (2)

[R=94 *] [T= A D M *] add, delete, modify — Geohydrologic Unit Entry No [256 # *]

Date [96 # / / *] month day year — Water Level [126= *] — % Water Contributed [132= *]

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

[R=90 *] [T= A D M *] add, delete, modify — Entry No [256 # *] — Depth to Top [91= *] — Depth to Bottom [92= *]

Unit Identifier [93= *] — Lithology [96= *] — Lithologic Modifier [97= *]

AQUIFER DATA (2)

[R=94 *] [T= A D M *] add, delete, modify — Geohydrologic Unit Entry No [256 # *]

Date [96 # / / *] month day year — Water Level [126= *] — % Water Contributed [132= *]

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

[R=90 *] [T= A D M *] add, delete, modify — Entry No [256 # *] — Depth to Top [91= *] — Depth to Bottom [92= *]

Unit Identifier [93= *] — Lithology [96= *] — Lithologic Modifier [97= *]

AQUIFER DATA (2)

[R=94 *] [T= A D M *] add, delete, modify — Geohydrologic Unit Entry No [256 # *]

Date [96 # / / *] month day year — Water Level [126= *] — % Water Contributed [132= *]

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

R=90 * | T= A D M * (add, delete, modify) | Entry No 256 # * | Depth to Top 91= . * | Depth to Bottom 92= . *

Unit Identifier 93= * | Lithology 96= * | Lithologic Modifier 97= *

AQUIFER DATA (2)

R=94 * | T= A D M * (add, delete, modify) | Geohydrologic Unit Entry No 256 # *

Date 95 # / / * (month, day, year) | Water Level 126= . * | % Water Contributed 132= *

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

R=90 * | T= A D M * (add, delete, modify) | Entry No 256 # * | Depth to Top 91= . * | Depth to Bottom 92= . *

Unit Identifier 93= * | Lithology 96= * | Lithologic Modifier 97= *

AQUIFER DATA (2)

R=94 * | T= A D M * (add, delete, modify) | Geohydrologic Unit Entry No 256 # *

Date 95 # / / * (month, day, year) | Water Level 126= . * | % Water Contributed 132= *

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

R=90 * | T= A D M * (add, delete, modify) | Entry No 256 # * | Depth to Top 91= . * | Depth to Bottom 92= . *

Unit Identifier 93= * | Lithology 96= * | Lithologic Modifier 97= *

AQUIFER DATA (2)

R=94 * | T= A D M * (add, delete, modify) | Geohydrologic Unit Entry No 256 # *

Date 95 # / / * (month, day, year) | Water Level 126= . * | % Water Contributed 132= *

GEOHYDROLOGIC UNIT DESCRIPTIONS (1)

R=90 * | T= A D M * (add, delete, modify) | Entry No 256 # * | Depth to Top 91= . * | Depth to Bottom 92= . *

Unit Identifier 93= * | Lithology 96= * | Lithologic Modifier 97= *

AQUIFER DATA (2)

R=94 * | T= A D M * (add, delete, modify) | Geohydrologic Unit Entry No 256 # *

Date 95 # / / * (month, day, year) | Water Level 126= . * | % Water Contributed 132= *

NOTES:

FORM NO. 9-1904-D

U.S. DEPT. OF INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

SITE NO.

Recorded by

Date

HYDRAULICS DATA

Site Ident No (5–19)

HYDRAULIC TEST DATA (1)

R = 98 * | T = * | Entry No 99 # * | Geohydrologic Unit Tested 100 = *

Depth to Top of Tested Interval 101 = * | Depth to Bottom 102 = * | Unit Characteristics 103 = A C * (aquifer, confining layer)

Remark or Comment 104 = *

COEFFICIENT RESULTS OF HYDRAULIC TEST (2)

R = 105 * | T = A D M * (add, delete, modify) | Test Entry No 99 # *

New Card for Each Set of Coefficient
Use Same R, T and Field 99 value

(Test Coefficients)	Field	Field
Results Entry No	106 # *	106 # *
Transmissivity	107 = *	107 = *
Horiz. Conductivity	108 = *	108 = *
Vert. Conductivity	109 = *	109 = *
Storage Coefficient	110 = *	110 = *
Leakance	111 = *	111 = *
Diffusivity	112 = *	112 = *
Specific Storage	113 = *	113 = *

Results Entry No	106 # *	106 # *
Transmissivity	107 = *	107 = *
Horiz. Conductivity	108 = *	108 = *
Vert. Conductivity	109 = *	109 = *
Storage Coefficient	110 = *	110 = *
Leakance	111 = *	111 = *
Diffusivity	112 = *	112 = *
Specific Storage	113 = *	113 = *

Results Entry No	106 # *	106 # *
	107 = *	107 = *
Horiz. Conductivity	108 = *	108 = *
Vert. Conductivity	109 = *	109 = *
Storage Coefficient	110 = *	110 = *
Leakance	111 = *	111 = *
Diffusivity	112 = *	112 = *
Specific Storage	113 = *	113 = *

Results Entry No	106 # *	106 # *
Transmissivity	107 = *	107 = *
Horiz. Conductivity	108 = *	108 = *
Vert. Conductivity	109 = *	109 = *
Storage Coefficient	110 = *	110 = *
Leakance	111 = *	111 = *
Diffusivity	112 = *	112 = *
Specific Storage	113 = *	113 = *

Results Entry No	106 # *	106 # *
Transmissivity	107 = *	107 = *
Horiz. Conductivity	108 = *	108 = *
Vert. Conductivity	109 = *	109 = *
Storage Coefficient	110 = *	110 = *
Leakance	111 = *	111 = *
Diffusivity	112 = *	112 = *
Specific Storage	113 = *	113 = *

U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

Recorded by ______________ Date ______________

MISCELLANEOUS DATA

Check One ____ English ____ Metric Units

Site Ident No [5 … 19]

COOPERATOR DATA (1)

R = 212 * | T = A D M * (add, delete, modify) | Cooperators Site identifier 213 = * | Registration No. 214 = *

Inspection Status 215 = * | Reason Unapproved 216 = * | Inspection Date 217 = / / * (month day year)

Remarks 218 = *

DATA ON MINOR SITE REPAIRS (1)

R = 164 * | T = A D M * (add, delete, modify)

New Card for each Repair Same R&T

	(Minor Repair)	(Minor Repair)
Entry No	165 # *	165 # *
Nature of Repair ①	166 = *	166 = *
Date Completed	167 = / / *	167 = / / *
Contractor	169 = *	169 = *
% Performance Chg	170 = *	170 = *

	(Minor Repair)	(Minor Repair)
Entry No.	165 # *	165 # *
Nature of Repair ①	166 = *	166 = *
Date Completed	167 = / / *	167 = / / *
Contractor	169 = *	169 = *
% Performance Chg.	170 = *	170 = *

DATA FOR MULTIPLE WELL GROUPS (1)

R = 203 * | T = A D M * (add, delete, modify) | No. Wells in Group 204 = * | Deepest Depth 205 = *

Shallowest Depth 206 = * | Construction Method 207 = D J V W Z * (drilled, jetted, driven, drive, wash, other) | Size of Well Field 262 = *

DATA FOR POND, TUNNEL OR DRAIN SITES (1)

R = 208 * | T = A D M * (add, delete, modify) | Longest Dimension 209 = * | Other (Width) Dimension 210 = * | Depth 211 = *

Orientation 263 = * | Dip 264 = *

DATA FOR COLLECTOR WELLS (1)

R = 216 * | T = A D M * (add, delete, modify)

New Card for each Lateral Same R&T

Entry No.	Depth to the Lateral	Length of Lateral	Diameter of Lateral	Screen Mesh
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *
220 # *	221 = *	222 = *	223 = *	224 = *

FOOT NOTES:

① Nature of repair

B	C	D	L	Ø	P	S	Z
blocked, off	cleaned,	deepened,	liner,	slotted or, perforated	plugged, back	screen, replaced	other

FORM NO. 9—1904—E

U.S. DEPT. OF INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

GROUND WATER SITE INVENTORY
WATER-LEVEL DATA

WELL NO. ____________

MP HEIGHT ____________

Site Ident. No. [5 ... 19] R = 234 * T = A *

	DATE	WATER LEVEL (BELOW LSD)	STATUS	METHOD	HOLD	CUT	DEPTH BELOW MP	REMARKS	DATE PUNCHED	DATE ENTERED
	/ / *	237 = . *	238 = *	239 = *						
	/ / *	237 = . *	238 = *	239 = *						
#	/ / *	237 = . *	238 = *	239 = *						
	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
#	/ / *	237 = . *	238 = *	239 = *						
#	/ / *	237 = . *	238 = *	239 = *						
#	/ / *	237 = . *	238 = *	239 = *						
#	/ / *	237 = . *	238 = *	239 = *						
#	/ / *	237 = . *	238 = *	239 = *						
#	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						
235 #	/ / *	237 = . *	238 = *	239 = *						

U.S. GOVERNMENT PRINTING OFFICE : 1975 O - 579-023

Method of Measurement

239 =	A	C	E	G	H	L	M	R	S	T	Z
	airline,	calibrated, airline	estimated,	pressure, gage	calibrated, pressure gage	geophysical, logs	manometer,	reported,	steel, tape	electric, tape	other

Site Status

238 =	D		G	H	Ø	P	R	S	T	Z
	dry,	flowing,	nearby, flowing	nearby, recently flowing	obstruction,	pumping,	recently, pumped	nearby, pumping	nearby, recently	other

Form No. 9-1904-C

U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

MODIFICATIONS SCHEDULE

Site Ident. No. 5 ... 19

Check One ____ English ____ Metric Units

MODIFICATION TRANSACTIONS (columns 20–80)	SUBMISSION Date	Initials	Done (✓)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

[0] - ZERO [ø] - ALPHA O [1] - ONE [I] - ALPHA I [2] - TWO [Z] - ALPHA Z [/] - SLASH [|] - VERT. BAR [-] - MINUS [_] - HORZ. BAR

APPENDIX B

Data Elements Directory

GROUND-WATER SITE INVENTORY
DATA BASE DEFINITION

SITE-ID

SITE-TYPE

RECORD-CLASSIFICATION

SOURCE-AGENCY

PROJECT-NUMBER

DISTRICT

STATE

COUNTY

*STATE-COUNTY

LATITUDE

LONGITUDE

COORDINATE-ACCURACY

LOCAL-NUMBER

LAND-NET-LOCATION

LOCATION-MAP-ID

LOCATION-MAP-SCALE

ALTITUDE

ALTITUDE-METHOD

ALTITUDE-ACCURACY

TOPOGRAPHIC-SETTING

OWDC-HYDROLOG-UNIT

DATE-CONSTRUCTED

*DATE-CONST-ACC

SITE-USE

WATER-USE

SECOND-WATER-USE

THIRD-WATER-USE

HOLE-DEPTH

WELL-DEPTH

WELL-DEPTH-SOURCE

WATER-LEVEL

WATER-LEVEL-DATE

*WL-DATE-ACCURACY

WATER-LEVEL-SOURCE

WATER-LEVEL-METHOD

SITE-LEVEL-STATUS

PUMP

GEOHYDRO-DATA-SOURCE

MEASURING-POINT-HEIGHT

MEASURING-POINT-DATE

*LAST-UPDATE

*VERIFIED

LIFT(RG):

  LIFT-TYPE

  LIFT-ENTRY-NO

  LIFT-DATE

  *LIFT DATE ACCURACY

```
    INTAKE-SETTING
    POWER-TYPE
  HORSEPOWER
  MAJOR-PUMP(RG):
    MANUFACTURER
    SERIAL-NUMBER
    POWER-COMPANY
    ACCOUNT
    METER
    CONSUMPTION
    PUMP-CAPACITY
    PUMP-MAINTAINER
    ADDITIONAL-LIFT
  STANDBY(RG):
    STANDBY-POWER-TYPE
    STANDBY-HORSEPOWER
  CONSTRUCTION(RG):
    CONST-SEQ-NO
    DATE-COMPLETED
    *CONST-DATE-ACCURACY
    CONTRACTOR
    CONST-DATA-SOURCE
    CONST-METHOD
    FINISH
    SEAL-TYPE
    SEAL-BOTTOM
    DEVELOPMENT-METHOD
    DEVELOPMENT-DURATION
  SPECIAL-TREATMENT
  HOLES(RG):
    HOLE-TOP
    HOLE-BOTTOM
    HOLE-DIAMETER
  CASINGS(RG):
    CASING-TOP
    CASING-BOTTOM
    CASING-DIAMETER
    CASING-MATERIAL
    CASING-THICKNESS
  OPENINGS(RG):
    OPENING-TOP
    OPENING-BOTTOM
    OPENING-TYPE
    SCREEN-MATERIAL
    OPEN-DIAMETER
    OPENING-WIDTH
    OPENING-LENGTH
  GEOHYDROLOGIC-UNITS(RG):
    GEOHYDRO-NUMBER
    GEOHYDRO-TOP
```

```
    GEOHYDRO-BOTTOM
    GEOHYDRO-UNIT
    LITHOLOGY
  LITH-MODIFIER
  AQUIFER(RG):
    AQUIFER-DATE
    AQUIFER-DATE-ACCURACY
    AQUIFER-STATIC-LEVEL
    AQUIFER-CONTRIBUTION
  HYDRAULIC-DATA(RG):
    HYDRAULIC-SEQ-NO
    HYDRAULIC-UNIT-ID
    TEST-INTERVAL-BOTTOM
    HYDRAULIC-UNIT-TYPE
    HYDRAULIC-REMARKS
    COEFFICIENTS(RG):
      COEFFICIENTS-SEQ-NO
      TRANSMISSIVITY
      HORIZONTAL-CONDUCTIVITY
      VERTICAL-CONDUCTIVITY
      STORAGE-COEFFICIENT
      LEAKANCE
      DIFFUSIVITY
      SPECIFIC-STORAGE
      BAROMETRIC-EFFICIENCY
  QUALITY-NETWORK(RG):
    QN-BEGIN-YEAR
    QN-END-YEAR
    DATA-SOURCE
    QN-FREQUENCY
    QN-ANALYSIS-TYPE (KEY)
    QN-NETWORK
  LEVEL-NETWORK(RG):
    LN-BEGIN-YEAR
    LN-END-YEAR
    LN-DATA-SOURCE
    LN-FREQUENCY
    LN-NETWORK
  PUMPAGE-NETWORK(RG):
    PN-BEGIN-YEAR
    PN-END-YEAR
    PN-DATA-SOURCE
    PN-FREQUENCY
    PN-DATA-METHOD
    PN-NETWORK
  FLOW-DATA(RG):
    FLOW-SEQ-NO
    FLOW-MEAS-DATE
    *FLOW-DATE-ACC
    FLOW-DISCHARGE
```

FLOW-DISCHARGE-SOURCE

FLOW-DISCHARGE-METHOD

FLOW-PROD-LEVEL

FLOW-STATIC-LEVEL

FLOW-SPECIFIC-CAP

FLOW-LEVEL-SOURCE

FLOW-LEVEL-METHOD

FLOW-PERIOD

PUMP-PRODUCTION(RG):

PUMP-SEQ-NO

PUMP-MEAS-DATE

*PUMP-DATE-ACC

PUMP-DISCHARGE

PUMP-DISCHARGE-SOURCE

PUMP-DISCHARGE-METHOD

PUMP-PROD-LEVEL

PUMP-STATIC-LEVEL

PUMP-SPECIFIC-CAP

PUMP-LEVEL-SOURCE

PUMP-LEVEL-METHOD

PUMP-PERIOD

OWNERS(RG):

OWNERSHIP-DATA

*OWNERSHIP-DATA-ACCURACY

LAST-NAME

FIRST-NAME

MIDDLE-INITIAL

MINOR-REPAIRS(RG):

REPAIR-SEQ-NO

REPAIR-NATURE

REPAIR-DATE

*REPAIR-DATE-ACCURACY

REPAIR-CONTRACTOR

PERFORMANCE-CHANGES

SPRINGS(RG):

SPRING-NAME

SPRING-TYPE

PERMANENCE

DISCHARGE-SPHERE

IMPROVEMENTS

NUMBER-SPRING-OPENINGS

FLOW-VARIABILITY

FLOW-VAR-ACCURACY

OTHER-DATA(RG):

TYPE-DATA

DATA-LOCATION

DATA-FORMAT

REMARKS(RG):

REMARK-DATE

REMARK

SITE-VISITS(RG):

INVENTORY-DATE

INVENTORY-PERSON

OTHER-IDS(RG):

OTHER-ID (KEY)

OTHER-ID-ASSIGNER

FIELD-WATER-QUALITY

FWQ-SAMPLE-DATE

*FWQ-DATE-ACC

FWQ-GEOHYDRO-UNIT

FWQ-PARAMETER

FWQ-MEASUREMENT

LOGS(RG):

LOG-TYPE (KEY)

LOG-TOP

LOG-BOTTOM

LOG-SOURCE

WELL-GROUP(RG):

NUMBER-WELLS

WG-DEEPEST

WG-SHALLOWEST

WG-METHOD

WG-SIZE

POND-TUNNEL-DRAIN(RG):

PTD-LENGTH

PTD-WIDTH

PTD-DEPTH

PTD-BEARING

PTD-DIP

COOPERATOR-DATA(RG):

COOPERATORS-ID

CONTRACTOR-REGISTRATION-NO

INSPECTION-STATUS (KEY)

REASON-UNAPPROVED

DATE-INSPECTED

COOPERATOR-REMARKS

LATERIALS(RG):

LATERAL-NUMBER

LATERAL-DEPTH

LATERAL-LENGTH

LATERAL-DIAMETER

LATERAL-MESH

Note: The RG is parentheses indicates that the specified name represents a repeating group type. The data elements indented below that name are components of the repeating group.

GROUND-WATER LEVELS DATA BASE DEFINITION

SITE-ID

WATER-LEVELS(RG):

  WL-MEAS-DATE

  *WL-DATE-ACC

  WL-MEASUREMENT

  WL-REMARK

  WL-MEAS-METHOD

OBS-WELL-HEADING(RG):

  HEADING-LINE

APPENDIX C

Sample Input System Report

U. S. GEOLOGICAL SURVEY WATER RESOURCES DIVISION
EDIT REPORT FOR
GROUND WATER SITE INVENTORY DATA BASE

DATE 11/22/75

PART 1:
CARD LISTING/SYNTAX ERRORS
Section 1

DATA SOURCE AGENCY CODE: USGS DISTRICT CODE: 16

ENTIFIER	DECK POSITION	SEQUENCE NUMBER	FREE FORMATTED DATA	ERROR CODE	MESSAGE
16453G01	CCC19	1042	R=0* T=M* 266=.95* 267=07/23/1974*	2000000	CARD OUT OF SEQUENCE
16234EC1	CCC20	1037	R=0* T=M* 266=.90* 267=07/11/1974*	2000000	CARD OUT OF SEQUENCE
...1643C5C1	CCC21	1031	R=183* T=A* 185=$MP #1 HOLE IN WELL SEAL .80 FT ABOVE LSD$*	2000000	CARD OUT OF SEQUENCE
443637116234BC1	CCC22	1040	R=183* T=A* 185=$MP #1 HOLE IN WELL SEAL .90 FT ABOVE LSD$*	2000000	CARD OUT OF SEQUENCE
443759116234?C1	CCC23	1070	R=183* T=A* 185=$MP #1 HOLE IN WELL SEAL .50 FT ABOVE LSD $*	2000000	CARD OUT OF SEQUENCE
947116373201	CCC24	1058	R=183* T=A* 185=$MP #1 HOLE IN WELL SEAL .95 FT ABOVE LSD$*	2000000	CARD OUT OF SEQUENCE
752116340101	CCC25	1064	R=183* T=A* 185=$MP #1 HOLE IN WELL SEAL .80 FT ABOVE LSD$*	2000000	CARD OUT OF SEQUENCE
726116331401	CCC26	1056	R=183* T=A* 185=$MP #1 END OF DISCHARGE PIPE 21.85 FT$*	2000000	CARD OUT OF SEQUENCE
	CCC27		R=183* T=A* 185='ABOVE LSD, INCLUDES HOZ CORRECTION.'*	2000000	CARD OUT OF SEQUENCE
443925116270201	CCC2E	1088	R=183* T=A* 185=$MP #1 HOLE IN WELL SEAL 1.15 FT ABOVE$*	2000000	CARD OUT OF SEQUENCE
	CCC29		R=183* T=A* 185='LSD.'*	2000000	CARD OUT OF SEQUENCE

U. S. GEOLOGICAL SURVEY WATER RESOURCES DIVISION
EDIT REPORT FOR
GROUND WATER SITE INVENTORY DATA BASE

PART 1:
CARD LISTING/SYNTAX ERRORS

DATA SOURCE AGENCY CODE: USGS DISTRICT CODE: 16

Section 2

FOR CODE	CAUSE OF ERROR	EFFECT OR ACTION TAKEN
2000000	THE VALUE IN CARD COLUMNS 1 THRU 4 OF THE INPUT CARD, CARD SEQUENCE NUMBER, IS NOT NUMERICALLY HIGHER THAN THE PREVIOUS CARD'S SIMILIAR VALUE.	NO ACTION TAKEN. USER IS WARNED THAT THE INPUT IS POSSIBLY OUT OF ORDER.

U. S. GEOLOGICAL SURVEY WATER RESOURCES DIVISION
EDIT REPORT FOR
GROUND-WATER SITE INVENTORY DATA BASE

PART 2:
EDIT DIAGNOSTICS
Section 2

DATA SOURCE AGENCY CODE: USGS DISTRICT CODE: 16

ER CODE	CAUSE OF ERROR	EFFECT OR ACTION TAKEN
200533	THE REPORTED MEASURING POINT HEIGHT IS OUTSIDE THE RANGE OF +5 OR -10.	THIS IS A WARNING ONLY.
200632	THE DATE OF THE SITE'S INITIAL CONSTRUCTION COMPLETION IS MISSING.	THIS IS A WARNING ONLY.

U. S. GEOLOGICAL SURVEY WATER RESOURCES DIVISION
EDIT REPORT FOR
GROUND WATER SITE INVENTORY DATA BASE

PART 3:
UPDATE DATA PLAYBACK
Section 1

DATA SOURCE AGENCY CODE: USGS DISTRICT CODE: 16

IDENTIFIER LEVEL 1 CONTROL REPORTING GROUP NAME DATA COMPONENT NAME		LEVEL 2 CONTROL ACTION TAKEN VALUE
3845C1 TES	CCCC =	MODIFY COMPONENTS
	SITE-ID	443515116384501
	SITE-TYPE	*** NULL ***
	RECORD-CLASSIFICATION	C
	SOURCE-AGENCY	USGS
	PROJECT-NUMBER	IDA74114C
	DISTRICT	16
CCCC	STATE	16
0008	COUNTY	87
0002	STATE-COUNTY	16,087
0009	LATITUDE	443515
0010	LONGITUDE	1163845
0011	COORDINATE-ACCURACY	S
0012	LOCAL-NUMBER	15N 03W 36CDDI
0013	LAND-NET-LOCATION	SESESWS36 T15N R03W B
0014	LOCATION-MAP-ID	CAMBRIDGE
0015	LOCATION-MAP-SCALE	62500
0016	ALTITUDE	2,710.0000000000
0017	ALTITUDE-METHOD	M
0018	ALTITUDE-ACCURACY	20
0019	TOPOGRAPHIC-SETTING	S
0020	LAND-HYDROLOG-UNIT	*** NULL ***
0021	DATE-CONSTRUCTED	01011949
0022	DATE-CONST-ACC	Y
0023	SITE-USE	W
0024	WATER-USE	H
0025	SECOND-WATER-USE	*** NULL ***
0026	THIRD-WATER-USE	*** NULL ***
0027	HOLE-DEPTH	76.0000000000
0028	WELL-DEPTH	76.0000000000
0029	WELL-DEPTH-SOURCE	C
0030	WATER-LEVEL	10.8500000000
0031	WATER-LEVEL-DATE	07181974
0032	WL-DATE-ACCURACY	D
0033	WATER-LEVEL-SOURCE	S
0034	WATER-LEVEL-METHOD	S
0037	SITE-STATUS	*** NULL ***
0039	PLAT	*** NULL ***
0036	TECHNICAL-DATA-SOURCE	*** NULL ***
0040	LAST-UPDATE	11221975
0041	VERIFIED	N
0266	MEASURING-POINT-HEIGHT	0.4000000000
0267	MEASURING-POINT-DATE	07181974

U. S. GEOLOGICAL SURVEY WATER RESOURCES DIVISION
EDIT REPORT FOR
GROUND WATER SITE INVENTORY DATA BASE

PART 3: UPDATE DATA PLAYBACK

DATA SOURCE AGENCY CODE: USGS DISTRICT CODE: 16

	UPDATE STATISTICS			
	DELETES	ADDS	MODIFYS	VERIFYS
SITES			19	
LIFT				
MAJOR-PUMP				
STANDBY				
CONSTRUCTION				
HOLES				
CASINGS				
OPENINGS				
GEOHYDROLOGIC-UNITS				
AQUIFERS				
HYDRAULIC-DATA				
COEFFICIENTS				
QUALITY-NETWORK				
LEVEL-NETWORK				
PUMPAGE-NETWORK				
FLOW-DATA				
PUMP-PRODUCTION				
OWNERS				
MINOR-REPAIRS				
SPRINGS				
OTHER-DATA				
REMARKS		9		
SITE-VISITS				
OTHER-IDS				
FIELD-WATER-QUALITY				
LOGS				
WELL-GROUP				
POND-TUNNEL-DRAIN				
COOPERATOR-DATA				
LATERALS				

APPENDIX D

Entering Data Into the System

NO PAGE D-2

Entering Data Into The System

INTRODUCTION

This appendix presents the procedures by which the reporting agency inputs and maintains ground-water data. Specifically, the following functions are described:

- execution of GW input edit,
- submission of data for update processing,
- retrieval of edit/update results.

EDIT-UPDATE PROCESS

PRELIMINARY EDITING

Figure D-1 schematically depicts the edit system. The user organization collects data for entry into the GW system using the input schedules described in the body of this manual. The data from these forms are transcribed to cards which are merged into the edit submission deck. This deck is then transmitted via a remote job entry (RJE) terminal to the U.S. Geological Survey National Center, located in Reston, Virginia. The invoked program, GW Edit Program, scans the input cards for syntactical correctness, edits the individual data elements for reasonableness of value and then verifies the consistency of the submitted data amongst themselves and in relation to previously reported data.

All generated diagnostics are recorded on the error file, which is subsequently processed by the GW Input Print Program. This program produces the GW Input Report which is routed back to the invoked user organization.

The user than reviews the returned report in order to identify and resolve detected discrepancies. The appropriate corrections, if any, are then punched and merged with the original submission. This combined deck is resubmitted to the National Center for re-editing to ensure that all errors were resolved and that no new ones were introduced. This process continues until the user has determined the accuracy of his submission to his satisfaction.

SUBMITTING DATA FOR UPDATE

Figure D-2 schematically represents the GW update system. The user organization collects data for entry into the GW system utilizing the

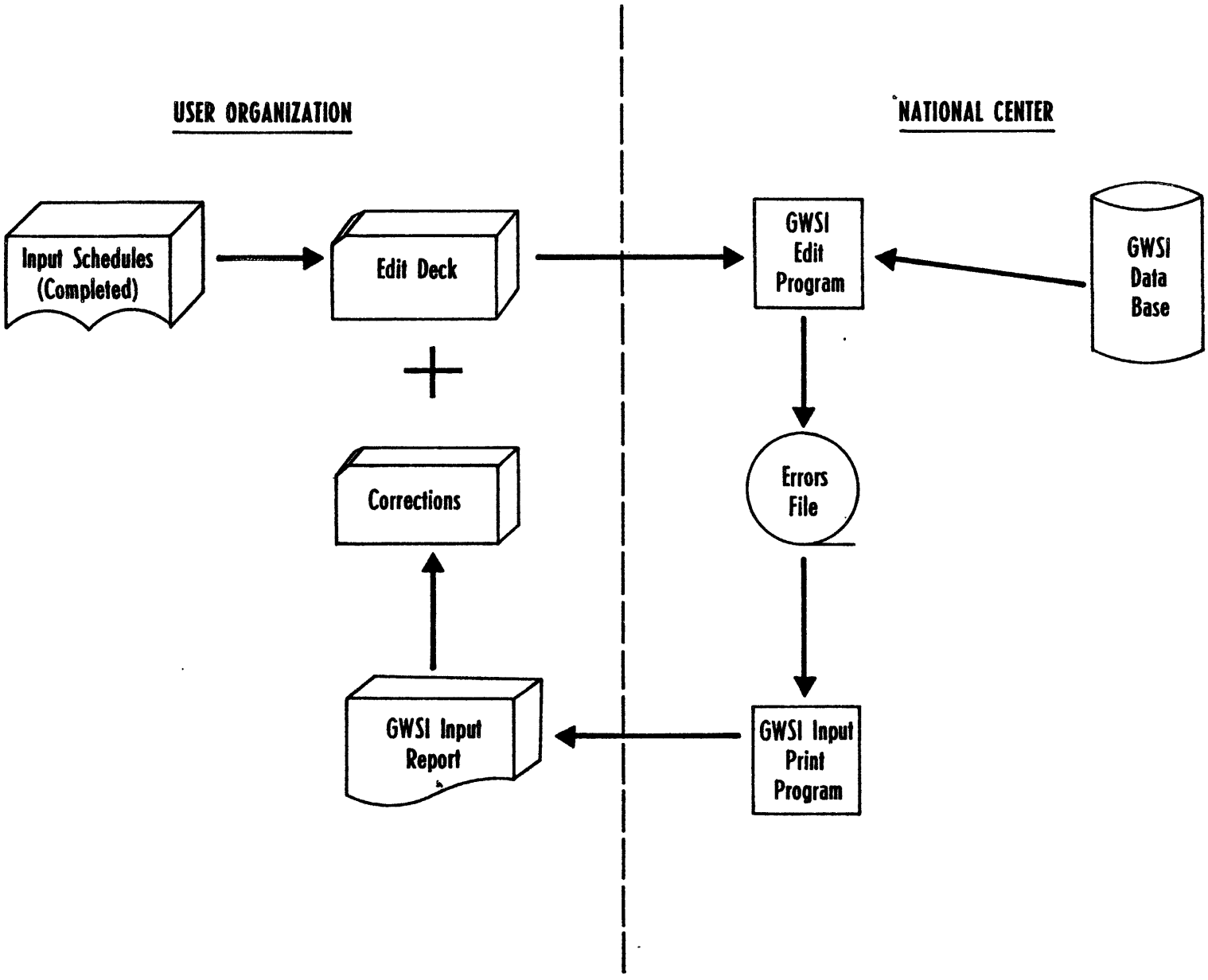


FIGURE D-1: Ground-water data input edit system

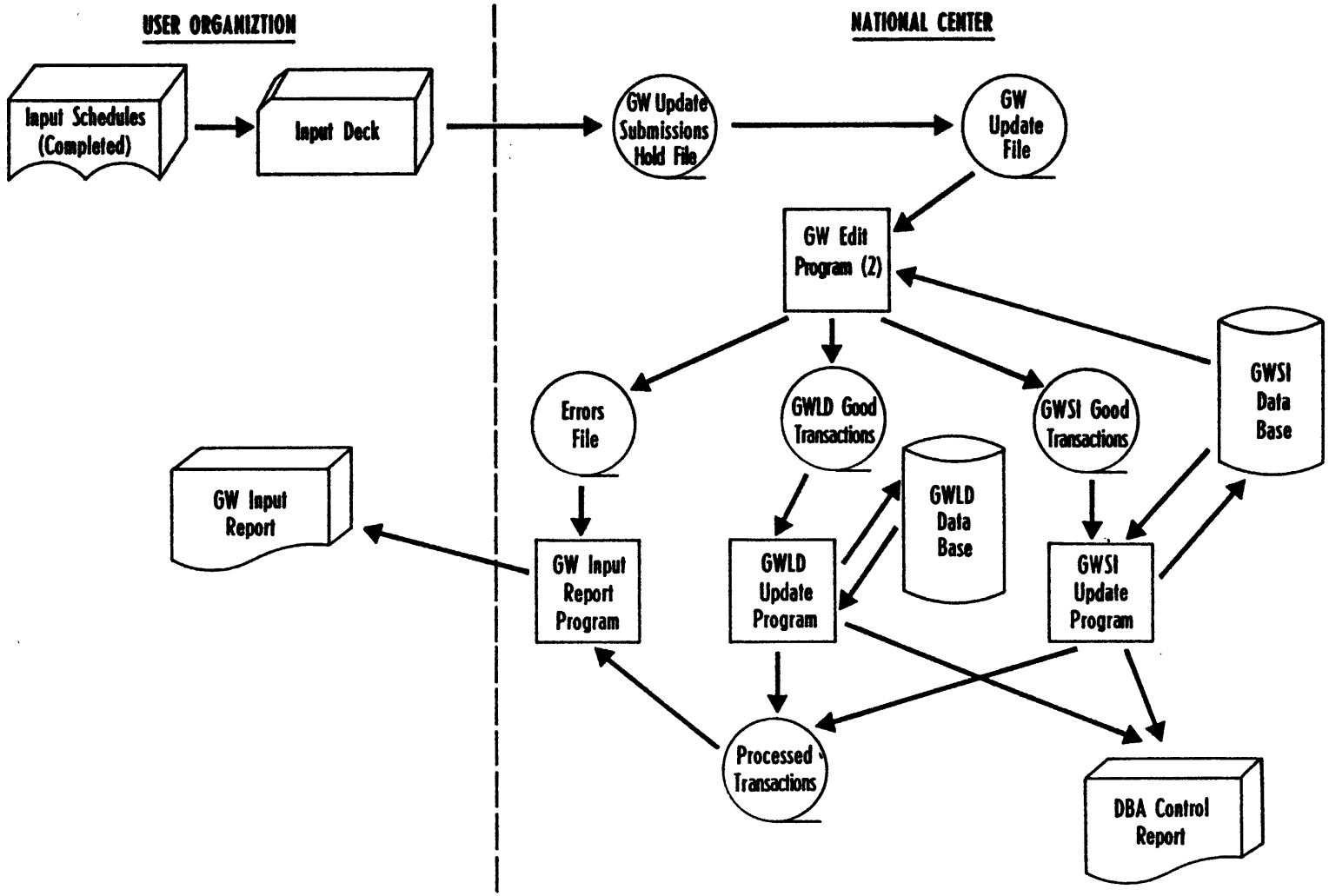


FIGURE D-2: Ground-water Data base update system

GW input schedules described in the main part of this manual. The data from these forms are transcribed to cards which are inserted into the update submission deck. This deck is then transmitted via a remote job entry (RJE) terminal to the U.S. Geological Survey National Center in Reston, Virginia.

The data so submitted is recorded onto a storage device along with data submitted by other users. On a scheduled* periodic basis the GW/DBA will release the data submitted up to the time by all the users for execution of the edit and update, saving the input file for a reasonable period of time. The hold file will be re-initialized to enable submissions for the next update cycle.

The GW/DBA will then initiate the update system. A special version of the GW Edit program is used. This version produces, in addition to the errors file, two "good transactions" files. These files contain only those transactions (more specifically, only those data element actions) which complied with all the edit logic. Note: Those actions resulting in warning messages are assumed good and are included in the good transactions files.

Upon successful completion of the edit, the GW and GWLD Update Programs are executed. These programs take the good transactions and apply them to the GWSI and GWLD data bases, respectively. A control report is generated by both updates for the GW/DBA along with a file of those transactions successfully processed.

The errors and processed transactions are then used by the GW Input Report Program to generate the GW Input Report. The reports are produced for each submitting organization and are automatically routed back to the appropriate remote terminals.

Note: The entire update process is under the absolute control of the GW Data Base Administrator. Therefore, the JCL of the setup deck discussed later only reflects the submission of the data into the hold file.

RETRIEVING THE EDIT/UPDATE INPUT REPORT

The input report is automatically generated and returned to the user as a result of executing the edit program or the periodic update of the GW data base (provided data were submitted by the user for the update). In the event, however, that a report was garbled on transmission, the user can invoke a procedure for re-initiating the transmission.

Note: This procedure will retrieve the results of the last update execution only. The results of an independent edit run can not be retrieved

*The GW Data Base Administrator (GW/DBA) shall establish and publish the schedule for GW data base updates and cut offs for data submissions.

through this means; the edit job has to be resubmitted in entirety.

CATALOGED PROCEDURES

Cataloged procedures for executing the functions described above have been stored in a system library. These procedures may be executed by entering the cards described under each procedure below.

PRELIMINARY EDIT

```
//          JOB (----

/*PROCLIB   WRD.PROCLIB

//  EXEC    GWSIEDIT

//SYSIN    DD  *

   Batch card

   Input cards

/*

//
```

The format of the batch card (which must be the first data card for each run of the program) is as follows:

Card Column	Contents
1-5	BATCH
6-9	Blank
10-12	The district or subdistrict code of the submitting USGS field office (USGS users only)
13	Blank
14-18	Source agency code (see Appendix E)
19-20	Blank
21	Option to list input cards - if not blank input cards are listed as the first part of the edit report
22-80	Not used

SUBMISSION FOR UPDATE

```
//          JOB (----
/*PROCLIB   WRD.PROCLIB
//  EXEC     GWSISUBM
//SYSUT1    DD *
   Batch Card
   Input Cards
/*
//
```

The format of the batch card for an update submission is the same as for the preliminary edit, except for an additional option. If a complete listing of each repeating group affected by the update is desired, enter a non blank character in column 23. The batch card must be the first card in the input stream; if it is missing or invalid, there will be no error message at submission time, but the entire batch of input will be ignored in the subsequent edit-update run.

EDIT/UPDATE REPORT RETRIEVAL

```
//          JOB (----
/*PROCLIB   WRD.PROCLIB
//  EXEC     GWSIRETR,PARM.REPORT='ddd,SSSSS,X,nnnnn'
//
```

The four parameters that may be passed to the program are:

ddd — USGS district or subdistrict code, as punched on the batch card when the data were submitted. This parameter is mandatory.

sssss — The source agency codes, as punched on the batch card when the data were submitted. This parameter is mandatory.

X — An option to override the report option requested on column 23 of the batch card. Three values are permitted:

- P - All output generated by the Edit Program will be printed, including a complete listing of each affected repeating group.
- S - All output except the listing of each affected repeating group will be printed.

T - Only the last page of the report (summary of good transactions) will be printed.

If this field is blank, the option selected on the batch card is not affected. If this option is omitted and the following option is selected, the comma must be coded to indicate the omission.

nnnn The page number of the first page of the report to be printed. This option is used if a partial report was retrieved and the remainder is desired without repeating the portion already printed. If this parameter is omitted, the report begins on page 1.