



USER'S MANUAL FOR THE NATIONAL
WATER INFORMATION SYSTEM OF THE
U.S. GEOLOGICAL SURVEY

GROUND-WATER SITE-INVENTORY SYSTEM

U.S. GEOLOGICAL SURVEY

Version 4.9



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U.S. Department of the Interior

Ken Salazar, Secretary

U.S. Geological Survey

Suzette Kimball, Acting Director

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For additional information write to:

U.S. Geological Survey
Water Resources Division
NWIS Testing, Data Transfer, Support
and Maintenance Unit, Mail Stop 437
12201 Sunrise Valley Drive
Reston, VA 20192

Copies of this report can be obtained from:

U.S. Geological Survey
Water Resources Division
NWIS Testing, Data Transfer, Support
and Maintenance Unit, Mail Stop 437
12201 Sunrise Valley Drive
Reston, VA 20192

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USER'S MANUAL FOR THE NATIONAL WATER INFORMATION SYSTEM OF THE U.S. GEOLOGICAL SURVEY

GROUND-WATER SITE-INVENTORY SYSTEM

**Open-File Report
Version 4.9**

ABSTRACT

The Ground-Water Site-Inventory (GWSI) System is a ground-water data storage and retrieval system that is part of the National Water Information System (NWIS) developed by the U.S. Geological Survey (USGS). The NWIS is a distributed water database in which data can be processed over a network of workstations and file servers at USGS offices throughout the United States. This system comprises the GWSI, the Automated Data Processing System (ADAPS), the Water-Quality System (QWDATA), and the Site-Specific Water-Use Data System (SWUDS).

The GWSI System provides for entering new sites and updating existing sites within the local database. In addition, the GWSI provides for retrieving and displaying ground-water and sitefile data stored in the local database. Finally, the GWSI provides for routine maintenance of the local and national data records. This manual contains instructions for users of the GWSI and discusses the general operating procedures for the programs found within the GWSI Main Menu.

1 INTRODUCTION

by Leslie W. Lenfest, Jr.

This section is an introduction to the GWSI User's Manual. It presents a management overview, description of the GWSI System, purpose of the manual, an acknowledgement of personnel who contributed to the completion of this manual, and a list of selected references.

1.1 Management Overview

The USGS investigates the occurrence, quantity, quality, distribution, and movement of the surface- and ground-water resources of the Nation. Hydrologic data collected during investigations of these resources provide valuable information that can be used for practical management of America's water. Easy access to hydrologic data facilitates the management process.

The GWSI is part of the NWIS, which is a data storage and retrieval system for hydrologic data collected by the USGS and its cooperators. The ADAPS, QWDATA System, and SWUDS comprise the other parts of the NWIS.

1.2 Description of the GWSI

The storage of ground-water data has evolved over several decades, from hand-written field notes stored in file cabinets at the State office level, to a distributed database where data can be processed over a network of UNIX workstations and file servers at USGS offices throughout the United States. Digital storage of data has developed from a punch-card data system in the late 1960's, to a national database in the mid 1970's, to a distributed database in the mid 1980's, and presently to an Ingres-based database where data are stored as tables. Much of the data are served to a Web-based national database (NWISWeb). The present system is a conversion of the distributed database on the Prime minicomputers to UNIX-based workstations and file servers located in USGS offices nationwide. Turnaround time for data storage and retrieval procedures has improved during this period from several days to minutes.

Currently, the GWSI is an interactive system, located on USGS workstations and file servers that maintain a dialog with the users through menus and prompts. The GWSI provides a method to enter new sites and update existing sites within the database. The GWSI also provides a method to retrieve and display, in several useful formats, ground-water and sitefile data that are stored in the local database. Finally, the GWSI provides for routine maintenance of the local and national data records.

The GWSI contains descriptive elements about sites where information is accessed from wells, test holes, springs, tunnels, drains, ponds or other excavations. There are over 500 components that make up the descriptive elements of the GWSI. These components are stored in a general data file called the "sitefile," which contains site information common to all members of NWIS, and in over 25 data tables that contain ground-water-related information. The sitefile primarily contains location information, physical and political descriptors, and data-collection methods used at the sites. The data tables contain well-construction, ground-water level, ground-water discharge, miscellaneous, geohydrologic, observation-well heading, and hydraulic data.

Ground-water data manipulations are initiated through GWSI utilities accessed through the GWSI Main Menu and submenus. The GWSI Main Menu is accessed by typing the system command "gws" at the user's terminal. This command displays the menu shown in the [Ground-Water Site Inventory Main Menu](#), discussed in Chapter 3.

The GWSI System provides two programs, Query Entry and Screen Entry, for entering field data into files used to update the local database. Files created by the entry programs are reviewed and validated by the Ground-Water Edit program to ensure that entered data conform to expected criteria. Once the data pass the Edit program, they are entered into the databases using the Ground-Water Update program. Data may be retrieved from the

local database through the Ground-Water Retrieval/Tabling program and displayed in graphical form using the Ground-Water Hydrograph program.

The GWSI System Menu is used to provide maintenance of the database and for other GWSI administrative tasks. Data Dictionary modifications and Site ID changes and deletes are other options on the GWSI System Menu.

1.3 Purpose of the Manual

The purpose of this User's Manual is to document the operating modules of the GWSI and provide additional operating instructions to the user.

The GWSI User's Manual describes the primary user functions found in the GWSI Main Menu and submenus:

Section	Description
1	Abstract and Introduction
2	GWSI Coding Instructions
3	GWSI Menus
4	Query Entry Program
5	Screen Entry Program
6	Ground-Water Edit Program
7	Ground-Water Update Program
8	Ground-Water Retrieval/Tabling Program
9	Ground-Water Hydrograph Program
10	Field Forms
11	Ground-Water Local Translation Program
12	Inventory Station in GWSI and QWDATA
13	Query Support Files
14	Change Default Database Number
15	Error Messages

The GWSI Coding Instructions (Chapter 2 of this manual) describe every data component contained in the sitefile and ground-water data records. Component descriptions consist of the component name, component number, the format of the entry, and a brief explanation of what the component is and how it is entered. Mandatory components are identified. Several components are limited in response to a list of acceptable names or terms; acceptable responses are tabulated in the manual for those components.

The GWSI Menus (Chapter 3) and their elements are described. Most of the nationally supported GWSI software that is used to submit and retrieve data is accessed from the Main Menu. Currently, there are 12 data entry and retrieval selections on the GWSI Main Menu, two submenus (Utilities and Documentation), access to a specified Local Menu, and two exit modes from the Main Menu. The Utilities submenu contains access to six data utility programs, two database maintenance menus, and two exit modes. The Documentation submenu now opens in a separate browser window.

GWSI Main Menu

The Query Entry program (Chapter 4) is the first of two modules in the GWSI Main Menu used to prepare sitefile and ground-water data for editing and updating. Although both modules create card images in user-specified records that ultimately are used for updating local and national databases, neither module *directly* updates databases. The Query Entry program is an interactive program that prompts the user with a defined list of GWSI components. It stores user responses along with the required component numbers, delimiters, and other program-generated elements used by the Edit program in a user-specified output file.

The Screen Entry program (Chapter 5) is the second module used to prepare data for editing and updating. Screen Entry input displays a “form” to be filled in by the user. It stores user responses along with the required component numbers, delimiters, and other program-generated elements in a user-specified output file.

The Edit program (Chapter 6) performs edit validation and logical data checks on the output files created by the Query Entry and Screen Entry programs. Edit checks may be initiated for interactive processing or batch processing. Both processing modes are discussed in Chapter 6.

The Update program (Chapter 7) is used to update the NWIS sitefile and the GWSI data records in the database after the data records have successfully passed the Edit GWSI Data program. This program is also available in either interactive or batch modes.

The Retrieval/Tabling program (Chapter 8) provides access to the data stored in the database. Retrieved data may be obtained in several formats: two types of general data tables, four types of water-level tables, and as a data record that can be used as input into other programs. A list of all component numbers and their descriptions is included in this section.

The Plot Hydrographs program (Chapter 9) provides graphical representation of ground-water levels. Data are retrieved using the Retrieval/Tabling program and displayed on the user’s monitor or at a designated printer using TKG2 graphics.

The Field Forms program (Chapter 10) generates a form that can be used in the field to collect data. The form contains user-specified components, and in some instances, may be pre-populated with data from the database that are helpful in determining the location of the site and in collecting the data.

```

*****
* Main Menu for WRD GWSI Database # 1 -- NWIS-4_4_1-4
*****
Code  Program Description          Code  Program Description
----  -
1 : Query Entry                    11 : Generate Field Forms
2 : Screen Entry
3 : Edit GW Data (from 1-2)        12 : QW Entry
4 : Update GW Data (from 3)        13 : Edit GW Data in Batch
5 : Update Sitefile Only (runs 2,3,4) 14 : Update GW Data in Batch
6 : Retrieval/Tables              16 : Plot Hydrographs
7 : Copy File (from 1-2) to Directory watin

10 : Change GW/QW Database #

92: Database Check Menu           91 : Utilities Menu
96 : Documentation Menu           93 : List Utilities Menu
98 : Exit to Previous Menu        97 : Local Menu
99 : Exit to UNIX

Enter UNIX Command or Select Program Code:

```

GWSI Main Menu

GWSI Utilities Menu

The Translate Station program (Chapter 11) is an interactive procedure that translates the station name of a site or sites into the agency code and site identification number of the site(s).

The Inventory Station program (Chapter 12) retrieves sites by agency and site identification number listed in a user-specified input file and reports the number of records in the sitefile, ground-water data records, water-quality data records, ADAPS, and SWUDS records for that site.

The Query Support Files procedure (Chapter 13) displays a menu that accesses specified site records, checks and lists the Parameter Code Dictionary, accesses the Geologic Unit Code and Federal Information Processing Standards (FIPS) Code files, and lists State and County data.

The Change Default Database Number utility (Chapter 14) allows the user to change the default number for ground-water and/or water-quality databases.

Error messages (Chapter 15) list the code number and description of all error messages that can occur during the Edit and Update procedures.

The user is led through the basic modules by a series of prompts and questions. In many instances, help is provided when a question mark (?) is typed in response to a prompt that is not understood. Additional documentation is available from the User's Manual or documentation files contained within the GWSI system.

1.4 Acknowledgements

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1.5 Selected References

- Baker, C.H., Jr., and Foulk, D.G., 1975, WATSTORE user's guide, v. 2, ground-water file: U.S. Geological Survey Open-File Report 75-589.
- Hantush, M.S., 1964, Hydraulics of wells, *in* Chow, Ven Te, ed., *Advances in Hydroscience*, v. 1: New York, Academic Press, Inc., p. 281-442.
- Lohman, S.W., and others, 1972, Definitions of selected ground-water terms--revisions and conceptual refinements: U.S. Geological Survey Water-Supply Paper 1988, 21 p.
- Luckey, R.R., 1987, The distributed ground-water database of the U.S. Geological Survey, *in* James, Larry G., and English, Marshall J., eds., *Irrigation systems of the 21st century: American Society of Civil Engineers Irrigation and Drainage Division Specialty Conference, Portland, Oregon, July 28-30, 1987, proceedings*, p. 263-269.
- Todd, D.K., 1980, *Groundwater Hydrology*: New York, John Wiley & Sons, p. 535.

2 NWIS SITEFILE AND GROUND-WATER SITE-INVENTORY CODING INSTRUCTIONS

*by Colleen Babcock, Richard R. Luckey, Charles O. Morgan and Diane M. Stephens
Revised by Leslie W. Lenfest and John W. Atwood*

There are eight sections in this coding manual, one for each of the related data types in the GWSI System. The Sitefile is shared by the Automated Data Processing System (ADAPS), the Quality of Water System (QW), the Ground-Water Site-Inventory System (GWSI), and the Site-Specific Water-Use Data System (SWUDS). Most of the components defined in this coding manual were originally defined in the WATSTORE User's Guide, Volume 2, Ground-Water File, Section B (Baker and Foulk, 1975). Each section of this manual contains several subsections defining the individual components within the related data types. Each subsection includes the: (a) component description, (b) component variable name used by the software, (c) component number, (d) length of each component, and (e) the Ingres attribute name. For example:

LAT-LONG ACCURACY (SCORAC/C11 - MANDATORY CHAR X -- coord_acy_cd)	
where:	
LAT-LONG ACCURACY =	Description
SCORAC =	Variable name
C11 =	Component number
CHAR X =	Length
coord_acy_cd =	Ingres attribute name

Primary Key (PK) is the group of components used to uniquely define the record in the database; for the Sitefile the primary key is the combination of Source Agency Code (C4) and Site Identification Number (C1). Also, some components are secondary keys (SK), which facilitate retrieving data from the database. Components that are commonly used for retrieving data are secondary keys.

Minimum Data Set requirements vary according to the type of site entered into the database. These are displayed in the following table. For example, the minimum data set required to describe a ground-water site is displayed under the 'GW' column of the following table. The following definitions apply to the table:

AT – Atmosphere; GL – Glacier; OC – Ocean; ST – Stream, canal; LK – Lake, reservoir, impoundment; ES – Estuary; GW – Ground-water other than spring; SB – Other subsurface; LA – Land; SP – Spring; AG – Aggregate ground-water; AS – Aggregate surface-water; AW – Aggregate water use; FA – Facility; WE – Wetland

Component number	Description	Mandatory for Web display	Mandatory for type of site (see section 1.9)							
			AT, GL, OC	LK, ST	SP	GW	SB, LA	AW, AS, AG	FA	WE, ES
C4	Source agency code	*	*	*	*	*	*	*	*	*
C1	Site identification number	*	*	*	*	*	*	*	*	*
C12/C900	Station name/local number	*	*	*	*	*	*	*	*	*
C9	Latitude	*	*	*	*	*	*		5	*
C10	Longitude	*	*	*	*	*	*		5	*
C11	Latitude/longitude accuracy		*	*	*	*	*		5	*
C35	Latitude/longitude method		*	*	*	*	*		5	*
C36	Latitude/longitude datum	*	*	*	*	*	*		5	*
C6	District code	*	*	*	*	*	*	*	*	*
C41	Country code	*	*	*	*	*	*	*	*	*
C7	State code	*	*	*	*	*	*	*	*	*
C8	County code	*	*	*	*	*	*	*	*	*
C802	Site type code	*	*	*	*	*	*	*	*	*
C813	Time zone code	*	*	*	*	*	*	*	*	*
C814	Daylight savings time flag	*	*	*	*	*	*	*	*	*
C3	Data reliability	1			*	*				
C23	Use of site	1,3				*				
Conditionally mandatory										
C17	Method altitude determined	2	2	2	2	2	2	2	2	2
C18	Altitude accuracy		2	2	2	2	2	2	2	2
C22	Altitude datum		2	2	2	2	2	2	2	2
C39	National water-use code		4	4	4	4	4	4	4	4

1 -- Ground-water sites only

2 -- Required if altitude (C16) is entered

3 -- Spring does not require Use of Site (C23) entry

4 -- Software enforces some restrictions for creation of a site on basis of site type; this field is mandatory to enter water-use data in SWUDS. [See SWUDS documentation](#) and [section 1.9](#)

5 -- Some FA sites do not require latitude and longitude; these include FA-CS, FA-FON, FA-GC, FA-HP, FA-ST, FA-TEP, FA-SEW, FA-WWD, FA-WWTP, FA-WDS, FA-WTP, FA-WU. See [section 1.9](#) for definitions.

Section 1. SITEFILE Components

The SITEFILE stores location and general information about a site for all disciplines. The primary key (PK) uniquely identifies each individual site in the database. The secondary keys (SK) facilitate retrieving data on the most commonly used fields.

Sub-Section	Attribute Name	Description Table = SITEFILE_##
1.1	agency_cd	Source agency code (C4)
1.2	site_no	Site identification number (C1)
1.3	site_cn	Person creating record (C61)
1.4	site_cr	Date created (C303)
1.5	site_mn	Person updating record (C62)
1.6	site_md	Date of last update (C40)
1.7	project_no	Project number (C5)
1.8	station_nm	Station name (C900/C12)
1.9	site_tp_cd	Primary and secondary site-type code (C802)
1.10	district_cd	District code (C6)
1.11	country_cd	Country code (C41)
1.12	state_cd	State code (C7)
1.13	county_cd	County code (C8)
1.14	lat_va	Latitude (C9)
1.15	long_va	Longitude (C10)
1.16	dec_lat_va	Latitude NAD83 (decimal degrees) (C909)
1.17	dec_long_va	Longitude NAD83 (decimal degrees) (C910)
1.18	coord_acy_cd	Lat/long accuracy (C11)
1.19	coord_meth_cd	Lat/long method (C35)
1.20	coord_datum_cd	Lat/long datum (C36)
1.21	alt_va	Altitude of land surface (C16)
1.22	alt_acy_va	Altitude accuracy code (C18)
1.23	alt_meth_cd	Method altitude determined (C17)
1.24	alt_datum_cd	Altitude datum (C22)
1.25	land_net_ds	Land-net location (C13)
1.26	topo_cd	Topographic setting code (C19)
1.27	huc_cd	Hydrologic unit code (C20)
1.28	basin_cd	Drainage basin code (C801)
1.29	tz_cd	Standard time zone code (C813)
1.30	local_time_fg	Local standard time flag (C814)
1.31	map_nm	Name of location map (C14)
1.32	map_scale_fc	Scale of location map (C15)
1.33	agency_use_cd	Agency use of site code (C803)
1.34	nat_water_use_cd	National water-use code (C39)
1.35	data_types_cd	Flags-type of data collected (30 values) (C804)
1.36	instruments_cd	Flags-instruments at site (30 values) (C805)
1.37	inventory_dt	Date site established/inventoried (C711)
1.38	site_rmks_cd	Remarks (C806)

Sub-Section	Attribute Name	Description Table = SITEFILE_##
1.39	site_web_cd	Record ready for Web (C32)
1.40	reliability_cd	Data Reliability code (C3)
1.41	construction_dt	Date of first construction (C21)
1.42	site_use_1_cd	Primary use of site (C23)
1.43	site_use_2_cd	Secondary use of site (C301)
1.44	site_use_3_cd	Tertiary use of site (C302)
1.45	water_use_1_cd	Primary use of water (C24)
1.46	water_use_2_cd	Secondary use of water (C25)
1.47	water_use_3_cd	Tertiary use of water (C26)
1.48	aqfr_type_cd	Aquifer-type code (C713)
1.49	aqfr_cd	Primary aquifer code (C714)
1.50	nat_aqfr_cd	National aquifer code (C715)
1.51	hole_depth_va	Hole depth (C27)
1.52	well_depth_va	Well depth (C28)
1.53	depth_src_cd	Source-of-depth data (C29)
1.54	drain_area_va	Drainage area (C808)
1.55	contrib_drain_area_va	Contributing drainage area (C809)
1.56	gw_file_cd	Other types of ground-water data (C712)

1.1 Source Agency Code

(SAGNCY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

The agency that is the source of the data. Enter, left-justified, the appropriate code. The source agency code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. "USGS" is the code for most data collected by the USGS. A list of all available source agency codes can be found in the file /usr/opt/nwis/support/aanwdx.all.agency on your NWIS server. New source agency codes can be requested using the Gnats Problem Reporting system: <http://wwwnwis.er.usgs.gov/usgs/cgi/bin/gnatsweb.pl>, using the category: GW-Reflists.

1.2 Site Identification Number

(SID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

Site identification numbers (site IDs) are assigned according to criteria that differs with the type of site that is being entered. Three categories of site IDs, with 2-character acronyms that are displayed in the following table, are (1) those based on latitude and longitude (LL), (2) those based on downstream order (DS), and (3) those specially created as water-use sites (WU). The site types are described more fully in [Section 1.9](#).

Site-type code section 1.9 (bold are primary types)	Site-type long name	Site IDs to be used (see following discussion)
AT	Atmosphere	LL
GL	Glacier	DS, LL
OC	Ocean	LL
OC-CO	Coastal	LL
LK	Lake, Reservoir, Impoundment	DS,LL
ST	Stream	DS,LL
ST-CA	Canal	DS,LL
ST-DCH	Ditch	DS,LL
ST-TS	Tidal stream	DS,LL
SP	Spring	DS,LL
GW	Well	LL
GW-CR	Collector or Ranney type well	LL
GW-EX	Extensometer well	LL
GW-HZ	Hyporheic-zone well	LL
GW-IW	Interconnected wells	LL
GW-MW	Multiple wells	LL
GW-TH	Test hole not completed as a well	LL
SB	Subsurface	LL
SB-CV	Cave	LL
SB-GWD	Groundwater drain	LL
SB-TSM	Tunnel, shaft, or mine	LL
SB-UZ	Unsaturated zone	LL
LA	Land	LL
LA-EX	Excavation	LL
LA-OU	Outcrop	LL
LA-SNK	Sinkhole	LL
LA-SH	Soil hole	LL
LA-SR	Shore	LL
AW	Aggregate water-use establishment	WU
AG	Aggregate ground-water use	WU
AS	Aggregate surface-water-use	WU
FA	Facility	*
FA-CI	Cistern	LL,WU
FA-CS	Combined sewer	LL,WU
FA-DV	Diversion	DS,LL
FA-FON	Field, Pasture, Orchard, or Nursery	LL,WU
FA-GC	Golf course	LL,WU
FA-HP	Hydroelectric plant	DS,LL
FA-QC	Laboratory or sample-preparation area	LL,WU
FA-LF	Landfill	LL,WU
FA-OF	Outfall	DS,LL
FA-PV	Pavement	LL,WU
FA-SEW	Wastewater sewer	LL,WU

Site-type code <u>section 1.9</u> (bold are primary types)	Site-type long name	Site IDs to be used (see following discussion)
FA-SPS	Septic system	LL,WU
FA-STC	Storm sewer	LL,WU
FA-TEP	Thermoelectric plant	LL,WU
FA-WIW	Waste injection well	LL
FA-WWD	Wastewater disposal	LL
FA-WWTP	Wastewater-treatment plant	LL,WU
FA-WDS	Water-distribution system	LL,WU
FA-WTP	Water-supply treatment plant	LL,WU
FA-WU	Water-use establishment	LL,WU
WE	Wetland	DS,LL
ES	Estuary	DS,LL

* - FA site types are not allowed without a secondary classification.

Latitude-longitude Site IDs

The latitude-longitude (LL) site ID is a 15-digit identification number assigned to the site and contains no blanks or alphabetic characters. Types of sites that use 15-digit LL site IDs include wells (GW), springs (SP), atmospheric(AT), and many other sites (see table). Although the site ID is formed initially from the latitude and longitude of a point believed to represent the location of the site followed by a 2-digit sequence number, the site ID is an *identifier* and not a *locator*. The site ID is a mandatory entry. Data will not be stored for the site if the identification number is missing or invalid.

It cannot be emphasized too strongly that the site ID, once assigned, is used as a pure number and has *no locational significance* beyond representing the best location available at the time the site ID was assigned. The latitude and longitude fields should be used for location.

The site ID is assigned as follows: use a method (map, Global Positioning System (GPS), Geographic Information System (GIS), etc.) that will provide the most precise location for a point representing the site.

IF THE SITE IS:	USE:
A tunnel	A point at the mouth of the tunnel
A drain	The discharge point of the drain
A pond or multiple well field	A point at the center of the pond or well field
A land (LA) site	A point at the center of the land feature

Determine the latitude and longitude of the point to the nearest 100th of a second.

The first six digits of the Site ID are the value of latitude, the 7th through 13th digits are the value of longitude, and the 14th and 15th digits are sequence numbers used to distinguish between sites at the same location.

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.

Downstream Order Site IDs

Downstream order (DS) site IDs are typically used for stream sites (ST), lakes (LK), and other sites where water is exposed on the land surface (see table). For surface-water sites where records are systematically collected, an 8 to 14-digit downstream order number is usually used for the site ID. Examples of sites that meet these criteria are:

- Continuous surface-water stations
- Partial record (surface-water and water-quality) stations
- Water-quality sites
- Spring stations where discharge measurements are routine

Downstream order numbers also may be assigned to springs (SP), glaciers (GL), wetlands (WE), estuaries (ES), and facilities (FA-) where water-use data are collected.

When downstream order is used, the first 8 to 14 positions of the field must contain digits. The remaining positions are blank.

A site ID containing a latitude-longitude and sequence number may be assigned to sites where there is difficulty in assigning a meaningful downstream order number or where data are obtained intermittently. In this case, positions 1-6 are coded with latitude, 7-13 are coded with longitude, and 14-15 are coded with a sequence number. Examples of surface-water sites that meet these criteria are:

- Water-quality grab sample sites
- Surface-water sites at which miscellaneous measurements are made
- Sites within large open-water areas (lakes, reservoirs, bays)

Water-Use site IDs

The water-use site ID is a 10- to 15-digit number which begins with the number '9' followed by the 2-digit State numeric FIPS code plus 7 to 12 digits that constitute a unique ID. Each science center can assign the 7 to 12 digits as desired, such as assigning them sequentially or basing them on a partial latitude and longitude. The use of the State numeric FIPS code allows the site ID to be unique nationally. The State code should be the same as that entered for component SSTATE/C007.

The water-use site ID format is used for aggregate ground water (AG), aggregate surface water (AS), and aggregate water-use establishment (AW) sites, and is an option for most facility sites. Aggregate water-use sites represent aggregations of specific sites defined by a geographic area or other common characteristics, and as such typically do not have latitudes and longitudes. The facility-site types that can use the water-use site ID format

also may be difficult to represent with a single point location, such as wastewater sewer (FA-SEW), golf course (FA-GC), and water-use establishment (FA-WU).

Diversions (FA-DV), outfalls (FA-OF), and hydroelectric plants (FA-HP) must use either the latitude-longitude or downstream order site ID format. Waste injection wells (FA-WIW) and wastewater disposal sites (FA-WWD) must use the latitude-longitude site ID format.

1.3 Person Creating Record (SCRUID/C61 - CHAR X(8) -- site_cn):

This field contains the user identification of the person creating the record. The user ID is entered automatically by the NWIS software.

1.4 Date Created (SCRDAT/C303 - CHAR X(14) -- site_cr)

This field contains the date on which the specified site was initially stored in the Sitefile. This field is produced by the Sitefile entry program, and the value will never change once established.

1.5 Person Updating Record (SUPUID/C62 - CHAR X(8) -- site_mn)

This field contains the user identification of the person who last updated the record. The user ID is entered automatically by the NWIS software.

1.6 Date of Last Update (SUPDAT/C40 - CHAR X(14) -- site_md)

This field contains the date that the last valid transaction of add, modify, or delete occurred for any item of the specified site. The field is populated by the Sitefile update program.

1.7 Project Number (SPRNO/C5 - SECONDARY-KEY CHAR X(12) -- project_no):

This optional field is a retrieval key by means of which all GWSI data collected for a particular project can be retrieved conveniently as a group. If the field is used, enter the 12-character WRD project number associated with data collection at the site. Where no single project number is applicable, leave the field blank. Note that this field can be used to assign no more than one project to a particular site, and is therefore not often meaningful at a site level. Users who anticipate that a site may be active for more than one project over its lifetime, should investigate use of the [ProjectNetworks](#) tables and software to define project information separately from the site level, thereby allowing a site to be related to many projects concurrently or sequentially.

1.8 Local Number Or Station Name

Ground-water site (SNAME/C12 - MANDATORY SECONDARY-KEY CHAR X(24); Surface-water site (SNAME/C900 -MANDATORY SECONDARY-KEY CHAR X(50) -- station_nm):

For ground-water sites, if a District well-numbering system is used, enter the system's number for the site here. The local number should be entered as it is to be printed; include all edit characters to be used in printing the local number. This is a text field.

For surface-water stations, enter the station name and location or local identifier. This field contains 50 characters including spaces and punctuation. It should take a form similar to:

PENDLETON HILL BK NR LITTLETON FALLS, PA

Meaningful and approved abbreviations may be used if necessary (but avoided if possible). Local Number or Station Name must be unique.

Note: When retrieving C12 only 24 characters are retrieved. If more than 24 characters are needed, choose C900, which will display 50 characters on output.

1.9 Site Type

(STYPE/C802 - MANDATORY VARCHAR X(7) site_tp_cd):

Site type is a field that characterizes where a site is or a sample is obtained in the hydrologic cycle. It is mandatory for all sites established in NWIS. Site type is a two-part code that comprises a primary and secondary hierarchy. The first two characters of the code, highlighted in **bold text** in the table below, form the *primary* site type. The second part of the code, which will always appear after a hyphen (-), is the *secondary* site type. Secondary site type is optional for all types of sites except facilities (FA); all facility sites must comprise both primary and secondary site type codes.

Site-type code (section 1.9)	Site-type long name	Site-type short name (links to definitions)
AT	Atmosphere	Atmosphere
GL	Glacier	Glacier
OC	Ocean	Ocean
OC-CO	Coastal	Coastal
LK	Lake, Reservoir, Impoundment	Lake
ST	Stream	Stream
ST-CA	Canal	Canal
ST-DCH	Ditch	Ditch
ST-TS	Tidal stream	Tidal SW
SP	Spring	Spring
GW	Well	Well
GW-CR	Collector or Ranney type well	Well-coll
GW-EX	Extensometer well	Well-extend
GW-HZ	Hyporheic-zone well	Well-hyp
GW-IW	Interconnected wells	Well-conn

Site-type code (section 1.9)	Site-type long name	Site-type short name (links to definitions)
GW-MW	Multiple wells	Well-multi
GW-TH	Test hole not completed as a well	Test hole
SB	Subsurface	Subsurface
SB-CV	Cave	Cave
SB-GWD	Groundwater drain	GW drain
SB-TSM	Tunnel, shaft, or mine	Tunl/mine
SB-UZ	Unsaturated zone	Unsat zone
LA	Land	Land
LA-EX	Excavation	Excavation
LA-OU	Outcrop	Outcrop
LA-SNK	Sinkhole	Sinkhole
LA-SH	Soil hole	Soil hole
LA-SR	Shore	Shore
AW	Aggregate water-use establishment	Agg estab
AG	Aggregate ground-water use	Agg GW WU
AS	Aggregate surface-water use	Agg SW WU
FA *	Facility	Facility
FA-CI	Cistern	Cistern
FA-CS	Combined sewer	Sewer-comb
FA-DV	Diversion	Diversion
FA-FON	Field, Pasture, Orchard, or Nursery	Agric area
FA-GC	Golf course	Golf
FA-HP**	Hydroelectric plant	Hydroelect
FA-QC	Laboratory or sample-preparation area	QC lab
FA-LF	Landfill	Landfill
FA-OF	Outfall	Outfall
FA-PV	Pavement	Pavement
FA-SPS	Septic system	Septic sys
FA-STC	Storm sewer	Sewer-strm
FA-TEP**	Thermoelectric plant	Thermoelec
FA-WIW	Waste-injection well	Waste inj
FA-SEW	Wastewater sewer	Sewer-wste
FA-WWD	Wastewater disposal	WW disp
FA-WWTP**	Wastewater-treatment plant	WWTP
FA-WDS	Water-distribution system	Wtr distr
FA-WTP**	Water-supply treatment plant	WTP
FA-WU	Water-use establishment	WU estab
WE	Wetland	Wetland
ES	Estuary	Estuary
SS ***	Specific source	SpecSrc

Table 1.9.1. Site types used in NWIS.

* - Facility sites must have a secondary site type.

** - Facility sites where locational information is screened from NWISWeb. Locational information includes the following list of components: Latitude (C9), Longitude (C10), Latitude NAD83 (decimal degrees) (C909), Longitude NAD83 (decimal degrees) (C910), Lat/long accuracy (C11), Lat/long method (C35), Lat/long datum (C36).

*** - Specific-source sites were transferred from NWIS 4.7, but they cannot be modified except to change their site type to a more descriptive code (C802). SS sites will not be displayed on NWISWeb.

Definitions of Site Types

Aggregate Ground-Water Use (AG) - An aggregate ground-water withdrawal/return site represents an aggregate of specific sites where ground water is withdrawn or returned and is defined by a geographic area or some other common characteristic. An aggregate ground-water site type is used when it is not possible or practical to describe the specific sites as springs or as any type of well including 'multiple wells', or when water-use information is available only for the aggregate. Aggregate sites that span multiple counties should be coded with 000 as the county code, or an aggregate site can be created for each county.

Aggregate Water-Use Establishment (AW) - An aggregate water-use establishment represents an aggregate class of water-using establishments or individuals that are associated with a specific geographic location and water-use category, such as all the industrial users located within a county or all self-supplied domestic users in a county. The aggregate class of water-using establishments is identified using the national water-use category code and optionally classified using the Standard Industrial Classification System Code (SIC code) or North American Classification System Code (NAICS code). An aggregate water-use establishment site type is used when specific information needed to create sites for the individual facilities or users is not available or when it is not desirable to store the site-specific information in the database. Data entry rules that apply to water-use establishments also apply to aggregate water-use establishments. Aggregate sites that span multiple counties should be coded with 000 as the county code, or an aggregate site can be created for each county.

Aggregate Surface-Water Use (AS) - An aggregate surface-water diversion/return site represents an aggregate of specific sites where surface water is diverted or returned and is defined by a geographic area or some other common characteristic. An aggregate surface-water site type is used when it is not possible or practical to describe the specific sites as diversions, outfalls, or land application sites, or when water-use information is only available for the aggregate. Aggregate sites that span multiple counties should be coded with 000 as the county code, or an aggregate site can be created for each county.

Atmosphere (AT) - A site established primarily to measure meteorological properties or atmospheric deposition.

Canal - (ST-CA) - An artificial watercourse designed for navigation, drainage, or irrigation by connecting two or more bodies of water; it is larger than a ditch.

Cave - (SB-CV) - A natural open space within a rock formation large enough to accommodate a human. A cave may have an opening to the outside, is always underground, and is sometimes submerged. Caves commonly occur by the dissolution of soluble rocks, generally limestone, but may also be created within the voids of large-rock aggregations, in openings along seismic faults, and in lava formations.

Cistern (FA-CI) - An artificial, non-pressurized reservoir filled by gravity flow and used for water storage. The reservoir may be located above, at, or below ground level. The water may be supplied from diversion of precipitation, surface, or ground-water sources.

Coastal (OC-CO) - An oceanic site that is located off-shore beyond the tidal mixing zone (estuary) but close enough to the shore that the investigator considers the presence of the coast to be important. Coastal sites typically are within three nautical miles of the shore.

Collector or Ranney type well (GW-CR) - An infiltration gallery consisting of one or more underground laterals through which ground water is collected and a vertical caisson from which ground water is removed. Also known sometimes as a "horizontal well." These wells typically produce large yield with small drawdown.

Combined Sewer (FA-CS) - An underground conduit created to convey storm drainage and waste products into a wastewater-treatment plant, stream, reservoir, or wastewater disposal site.

Diversion (FA-DV) - A site where water is withdrawn or diverted from a surface-water body (e.g. the point where the upstream end of a canal intersects a stream, or point where water is withdrawn from a reservoir). Includes sites where water is pumped mechanically for use elsewhere.

Ditch (ST-DCH) - An excavation artificially dug in the ground, either lined or unlined, for conveying water for a drainage or irrigation; it is smaller than a canal.

Ground Water Drain (SB-GWD) - An underground pipe or tunnel through which ground water is artificially diverted to surface water for the purpose of reducing erosion or lowering the water table. A drain typically is open to the atmosphere at its lowest point, in contrast to a well which is open at the highest point.

Estuary - (ES) - A coastal inlet of the sea or ocean; especially the mouth of a river, where tide water normally mixes with stream water. Salinity in estuaries typically ranges from 1 to 25 Practical Salinity Units (psu), as compared to oceanic values around 35 psu. See also: tidal stream and coastal.

Excavation (LA-EX) - An artificially constructed cavity in the earth that is deeper than the soil (see soil hole), larger than a well bore (see well and test hole), and substantially open to the atmosphere. The diameter of an excavation typically is similar to or larger than the depth. Excavations include building-foundation diggings, roadway cuts, and surface mines.

Extensometer (GW-EX) - A well equipped to measure small changes in the thickness of the penetrated sediments, such as those caused by ground-water withdrawal or recharge.

Facility (FA) - A non-ambient location where environmental measurements are expected to be strongly influenced by current or previous activities of humans. Sites identified with a "facility" primary site type must be further classified with one of the applicable secondary site types.

Field, Pasture, Orchard, or Nursery (FA-FON) - A water-using facility characterized by an area where plants are grown for transplanting, for use as stocks for budding and grafting, or for sale. Irrigation water may or may not be applied.

Glacier (GL) - Body of land ice that consists of recrystallized snow accumulated on the surface of the ground and moving slowly downslope over a period of years or centuries.

Golf Course (FA-GC) - A place-of-use, either public or private, where the game of golf is played. A golf course typically uses water for irrigation purposes. Should not be used if the site is a specific hydrologic feature or facility, but can be used especially for water-use sites.

Hydroelectric Plant (FA-HP) - A facility that generates electric power by converting potential energy of water into kinetic energy. Typically, turbine generators are turned by falling water.

Hyporheic-zone Well (GW-HZ) - A permanent well, drive point, or other device intended to sample a saturated zone in close proximity to a stream.

Interconnected Wells (GW-IW) - Collector or drainage wells connected by an underground lateral.

Laboratory of QC Samples (FA-QC) - Laboratory or sample preparation area. A site where some types of quality-control samples are collected, where equipment and supplies for environmental sampling are prepared, and (or) where selected analyses of environmental samples are completed. Equipment blank samples are commonly collected at this site type, as are samples of locally-produced deionized water. This site type is used when the data cannot be associated with a unique environmental data-collection site.

Lake, Reservoir, Impoundment (LK) - An inland body of standing fresh or saline water that is generally too deep to permit submerged aquatic vegetation to take root across the entire body (cf: wetland). This site type includes an expanded part of a river, a reservoir behind a dam, and a natural or excavated depression containing a water body without surface-water inlet and (or) outlet.

Land (LA) - A location on the surface of the earth that is not normally saturated with water. (See also: Wetland).

Landfill (FA-LF) - A typically dry location on the surface of the land where primarily solid waste products are currently, or previously have been, aggregated and sometimes covered with a veneer of soil. See also: Wastewater disposal and waste-injection well.

Multiple Wells (GW-MW) - A group of wells that are pumped through a single header and for which little or no data about the individual wells are available

Ocean (OC) - Site in the open ocean, gulf, or sea. (See also: Coastal, estuary, and tidal stream).

Outcrop (LA-OU) - The part of a rock formation that appears at the surface of the surrounding land.

Outfall (FA-OF) - A site where water or wastewater is returned to a surface-water body, e.g. the point where wastewater is returned to a stream. Typically, the discharge end of an effluent pipe.

Pavement (FA-PV) - A surface site where the land surface is covered by a relatively impermeable material, such as concrete or asphalt. Pavement sites are typically part of transportation infrastructure, such as roadways, parking lots, or runways.

Septic System (FA-SPS) - A site within or in close proximity to a subsurface sewage disposal system that generally consists of: (1) a septic tank where settling of solid material occurs, (2) a distribution system that transfers fluid from the tank to (3) a leaching system that disperses the effluent into the ground.

Shore (LA-SR) - The land along the edge of the sea, a lake, or a wide river where the investigator considers the proximity of the water body to be important. Land adjacent to a reservoir, lake, impoundment, or oceanic site type is considered part of the shore when it includes a beach or bank between the high and low water marks.

Sinkhole (LA-SNK) - A special type of depression that results from the dissolution 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. A crater formed when the roof of a cavern collapses; usually found in limestone areas. Surface water and precipitation that enter a sinkhole usually evaporate or infiltrate into the ground rather than drain into a stream.

Soil Hole (LA-SH) - A small excavation into soil at the top few meters of earth surface. Soil generally includes some organic matter derived from plants. Soil holes are created to measure soil composition and properties. Sometimes electronic probes are inserted into soil holes to measure physical properties, and (or) the extracted soil is analyzed.

Specific Source (SS) - A legacy site from NWIS 4.7 or earlier which had insufficient information to be mapped to a current site type. Specific Source was used for sites when none of the other Station Types applied. Most of these sites are believed to be some type

of Facility and may have water-quality information associated with them. Sites coded as Specific Source cannot be edited except to change the site type and will not be displayed on NWISWeb.

Spring (SP) - A location at which the water table intersects the land surface, resulting in a natural flow of ground water to the surface. Springs may be perennial, intermittent, or ephemeral.

Storm Sewer (FA-STSS) - An underground conduit created to convey storm drainage into a stream channel or reservoir. If the sewer also conveys liquid waste products, then the "combined sewer" secondary type should be used.

Stream (ST) - A body of running water moving under gravity flow in a defined channel. The channel may be entirely natural, or altered by engineering practices through straightening, dredging, and (or) lining. An entirely artificial channel should be qualified with the "canal" or "ditch" secondary site type.

Subsurface (SB) - A location below the land surface, but not a well, soil hole, or excavation.

Test Hole (GW-TH) - 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 hole 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 should be in this class.

Thermoelectric Plant (FA-TEP) - A facility that uses water in the generation of electricity from heat. Typically turbine generators are driven by steam. The heat may be caused by various means, including combustion, nuclear reactions, and geothermal processes.

Tidal Stream (ST-TS) - A stream reach where the flow is influenced by the tide, but where the water chemistry is not normally influenced. A site where ocean water typically mixes with stream water should be coded as an estuary.

Tunnel, Shaft, or Mine (SB-TSM) - A constructed subsurface open space large enough to accommodate a human that is not substantially open to the atmosphere and is not a well. The excavation may have been for minerals, transportation, or other purposes. See also: Excavation.

Unsaturated Zone (SB-UZ) - A site equipped to measure conditions in the subsurface deeper than a soil hole, but above the water table or other zone of saturation.

Water-distribution System (FA-WDS) - A site located somewhere on a networked infrastructure that distributes treated or untreated water to multiple domestic, industrial, institutional, and (or) commercial users. May be owned by a municipality or community, a water district, or a private concern.

Waste-injection Well (FA-WIW) - A facility used to convey industrial waste, domestic sewage, brine, mine drainage, radioactive waste, or other fluid into an underground zone. An oil-test or deep-water well converted to waste disposal should be in this category. A well where fresh water is injected to artificially recharge the groundwater supply or to pressurize an oil or gas production zone by injecting a fluid should be classified as a well (not an injection-well facility), with additional information recorded under Use of Site.

Wastewater Sewer (FA-SEW) - An underground conduit created to convey liquid and semisolid domestic, commercial, or industrial waste into a treatment plant, stream, reservoir, or disposal site. If the sewer also conveys storm water, then the "combined sewer" secondary type should be used.

Wastewater Disposal (FA-WWD) - A site where the disposal of waste water on land occurs. Use "waste-injection well" for underground waste-disposal sites.

Wastewater-treatment Plant (FA-WWTP) - A facility where wastewater is treated to reduce concentrations of dissolved and (or) suspended materials prior to discharge or reuse.

Water-supply Treatment Plant (FA-WTP) - A facility where water is treated prior to use for consumption or other purpose.

Water-use Establishment (FA-WU) - A place-of-use (a water using facility that is associated with a specific geographical point location, such as a business or industrial user) that cannot be specified with any other facility secondary type. Water-use place-of-use sites are establishments such as a factory, mill, store, warehouse, farm, ranch, or bank. A place-of-use site is further classified using the national water-use category code (c39) and optionally classified using the Standard Industrial Classification System Code (SIC code) or North American Classification System Code (NAICS code). See also: Aggregate site.

Well (GW) - A hole or shaft constructed in the earth intended to be used to locate, sample, or develop groundwater, oil, gas, or some other subsurface material. The diameter of a well is typically much smaller than the depth. Wells can be used to recharge ground water artificially or to pressurize oil and gas production zones. Additional information about specific kinds of wells should be recorded under the secondary site types or the Use of Site field. Underground waste-disposal wells should be classified as waste-injection wells (FA-WIW).

Wetland (WE) - Lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Wetlands are found from the tundra to the tropics and on every continent except Antarctica. Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in

saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands may be forested or un-forested, and naturally or artificially created.

Attribute classes for site types

Various types of data that are stored in NWIS can be associated with certain types of sites. For example, every type of site defined above can be located by latitude and longitude (although aggregate water-use sites need not be), whereas only a few types of sites can have a drainage area. This section describes the attribute classes that are NOT allowed for primary site types. *Any attribute or attribute class that does not appear in this table is, by default, allowed for all types of sites – and this is true of most attributes stored in NWIS.* Secondary site types almost always have the same attribute classes as their primary site type.

Attribute classes are attributes that are grouped together because they share common properties or characteristics. The specific subsystems, tables, or fields that comprise an attribute class are described after the table. The attributes themselves can be found elsewhere in the NWIS documentation. For example, the attribute class “hole” includes the attributes hole depth, well depth, and source of depth information (in the SITEFILE) and all attributes in the tables GW_HOLE_## and GW_LOGS_## (table 1.9.3), and the site types that do not include hole information include atmospheric, stream, spring, aggregate water use, and most of the facilities (table 1.9.2).

Attributes that are stored in NWIS but are not described in the next two tables are *allowed* for all site types. For example, all site types may have address, owner, and network information. All site types may store time-series data in ADAPS and discrete data in QWDATA.

	Primary site type (see table above)												
Attribute class	AT	GL	OC	LK	ST	SP	GW	SB	LA	AG, AS, AW	FA	WE	ES
drainage_area	No	No	No	Yes	Yes	No	No	No	Optional	No	No	Yes	Yes
latlong	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes ¹	Yes	Yes
visit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
level	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
gunit	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
hydr	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
hole	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No ²	Yes	Yes
repair	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No
well	No	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	No
construction	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
lift	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
spring	No	No	No	No	No	Yes	No	No	Optional	No	No	No	No

	Primary site type (see table above)												
Attribute class	AT	GL	OC	LK	ST	SP	GW	SB	LA	AG, AS, AW	FA	WE	ES
water_use	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
thermopower	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
site_use	No	No	No	No	No	Yes	Yes	Yes ³	Optional	Yes (AG only)	Yes	No	No
reliability	No	No	No	No	No	Yes	Yes	Yes	Optional	Yes (AG only)	No	No	No

Table 1.9.2. Attribute classes and site types.

[Yes, the attribute class is allowed; No, the attribute class is not allowed. Site-type codes are explained in [table 1.9.1](#), and attribute classes are explained in [table 1.9.3](#).]

1 – Latlong is optional for FA-CS, FA-FON, FA-GC, FA-HP, FA-SPS, FA-STS, FA-TEP, FA-SEW, FA-WWD, FA-WWTP, FA-WDS, FA-WTP, and FA-WU (see definitions above). The rest of the facilities require latitude and longitude.

2 – Gunit is allowed for FA-SPS and FA-WIW (see definitions following table 1.9.1).

3 – Site_use is allowed for SB and SB-UZ.

Attribute class	NWIS tables and fields
drainage_area	SITEFILE fields C808, C809
latlong	SITEFILE field C9, C10, C909, C910, C11, C35, C36
visit	GW_VIST_##
level	GW_LEV_##, GW_OBS_##, GW_MPNT_##
gunit	GW_GEOH_##, GW_AQFR_##, SITEFILE fields C714, C715, C713
hydr	GW_HYDR_##, GW_COEF_##, GW_DISC_##
hole	GW_HOLE_##, GW_LOGS_##, SITEFILE fields C27, C28, C29
repair	GW_REPR_##
well	GW_SPEC_##, GW_CSNG_##, GW_OPEN_##
construction	GW_CONS_##
lift	GW_LIFT_##
spring	GW_SPNG_##
water_use	ANCILLARY_##, WU_SITE_##
thermopower	FSSL_FUEL_##
site_use	SITEFILE fields C23, C301, C302
reliability	SITEFILE field C3

Table 1.9.3. NWIS tables and fields that are grouped by attribute class.

[Cxxx, component number]

1.10 District Code

(SDIST/C6 - MANDATORY CHAR X(3) -- district_cd):

In the first two positions of the field, enter the USGS District code that identifies the source of the data. If data are collected by a Subdistrict office, a one-character code assigned by the District may be entered in the third position to identify the Subdistrict office. The two-character district code is mandatory; data will not be stored for the site if this field is blank.

1.11 Country Code

(SCNTRY/C41 - MANDATORY SECONDARY-KEY CHAR X(2) -- country_cd):

Enter the Federal Information Processing Standards (FIPS) alpha code for the Country in which the site is located. Country code is a mandatory entry (combined with SSTATE and SCNTY for secondary key).

Code	Description
US	United States
AF	Afghanistan
AY	Antarctica
BG	Bangladesh
CN	Canada
DR	Dominican Republic
ES	El Salvador
FM	Federated States of Micronesia
IZ	Iraq
GT	Guatemala
HA	Haiti
HO	Honduras
JA	Japan
MX	Mexico
NU	Nicaragua
PE	Peru
PM	Panama
PS	Palau
RM	Marshal Islands
RP	Philippines
UP	Ukraine

1.12 State Code

(SSTATE/C7 - MANDATORY SECONDARY-KEY CHAR X(2) -- state_cd):

Enter the Federal Information Processing Standards (FIPS) numeric code for the State, Territory, Possession, or Commonwealth in which the site is located. These codes are found in FIPS PUB5-2. State code is a mandatory entry (combined with SCNTRY and SCNTY for secondary key). Include leading zero if appropriate; data will not be stored

for the site if this field is blank. The State codes are found in the query support files software.

1.13 County Code

(SCNTY/C8 - MANDATORY SECONDARY-KEY CHAR X(3) county_cd):

Enter the FIPS numeric code for the county or county equivalent in which the site is located. These codes are found in FIPS PUB6-4. County code is a mandatory entry (combined with SCNTRY and SSTATE for secondary key). Include leading and trailing zeros if appropriate; data will not be stored if this field is blank.

1.14 Latitude

(SLAT/C9 - MANDATORY SECONDARY-KEY CHAR X(7) .XX-- lat_va):

Enter the best available value for the latitude of the site in degrees, minutes, and seconds. Seconds may be entered to 100ths of a second. Use leading zeros if needed. The value of latitude should be updated as more precise information becomes available. Six digits 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 this sign, if required.) There are special rules about entry of latitude for water-use sites. Please refer to section 1.2, Site Identification Number.

1.15 Longitude

(SLONG/C10 - MANDATORY SECONDARY-KEY CHAR X(8) .XX -- long_va):

The world standard for polarity of longitudes assigns negative signs to longitudes in the western hemisphere and positive signs to longitudes in the eastern hemisphere. In order to preserve the traditional entry of longitudes in the U.S., this convention will not be followed for data entry of longitude (C010) in National Water Information System (NWIS) databases. However, the appropriate sign is automatically assigned for decimal longitudes (C910).

Enter the best available value for the longitude of the site, in degrees, minutes, and seconds. Seconds may be entered to 100ths of a second. Use leading zeros for values <100. The value of longitude should be updated as more precise information becomes available. Seven digits 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 this sign, if required.)

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 lat/long accuracy (see *Lat/Long Accuracy Method*). There are special rules about entry of longitude for water-use sites. Please refer to section 1.2, Site Identification Number.

1.16 Latitude NAD83 (decimal degrees)

(SLATD/C909 - CHAR X(13) -- dec_lat_va):

This field contains the calculated value of latitude in decimal degrees in terms of **NAD83** datum. Latitude is calculated from degrees-minutes-seconds latitude (C009) and is converted, if necessary, from **NAD27** to **NAD83** datum. If conversion is not possible (i.e. a datum other than NAD27 or NAD83 was used in C36), this field is blank. This field is only available on output.

1.17 Longitude NAD83 (decimal degrees)

(SLONGD/C910 - CHAR X(14) -- dec_long_va):

This field contains the calculated value of longitude, in decimal degrees, in terms of **NAD83** datum. Longitude is calculated from degrees-minutes-seconds longitude (C010) and is converted, if necessary, from **NAD27** to **NAD83** datum. If conversion is not possible, (i.e. a datum other than NAD27 or NAD83 was used in C36), this field is blank. This field is only available on output.

1.18 Lat-Long Coordinate Accuracy

(SCORAC/C11 - MANDATORY CHAR X(1) -- coord_acy_cd):

Enter the appropriate code on the schedule to indicate the accuracy of the latitude-longitude values. The codes and their descriptions are shown on the following page:

Code	Description
H	Accurate to +/- .01 second (differentially corrected GPS)
1	Accurate to +/- .1 second (differentially corrected GPS)
5	Accurate to +/- .5 second (Precise Positioning Service (PLGR/PPS GPS))
S	Accurate to +/- 1 second
R	Accurate to +/- 3 seconds (Standard Positioning Service (SPS GPS))
F	Accurate to +/- 5 seconds
T	Accurate to +/- 10 seconds
M	Accurate to +/- 1 minute
U	Unknown

1.19 Lat/Long Method

(SCORMT/C35 - MANDATORY CHAR X(1) -- coord_meth_cd):

Select the method used to determine latitude-longitude values from the following list:

Code	Description
C	Calculated from land net
D	Differential Global Positioning System (DGPS)
G	Global positioning system (GPS), Standard Positioning Service (SPS) or Precise Positioning Service (PPS)

Code	Description
L	Long-range navigation system
M	Interpolated from map
N	Interpolated from Digital Map
R	Reported
S	Transit, theodolite, or other surveying method
U	Unknown

1.20 Lat/Long Datum

(SCORDM/C36 - MANDATORY CHAR X(10) -- coord_datum_cd):

Enter the horizontal datum code for the latitude/longitude coordinates (C9 and C10).

Lat/Long Datum is **mandatory** when latitude and longitude are entered. There are currently more than 300 horizontal datums available for entry. For a complete current list and their valid codes see: /usr/opt/nwis/support/edit.tables/scordm.edi.

The only datums that can be converted on output are NAD27 (North American Datum of 1927) and NAD83 (North American Datum of 1983). NWIS uses the North American Datum Conversions (NADCON) of the National Geodetic Survey to convert from NAD27 to NAD83 or vice-versa. Conversions to or from other datums are not available.

1.21 Altitude of Land Surface

(SDATUM/C16 - CHAR X(8) -- alt_va):

For ground-water sites, the altitude of land surface is the altitude in feet of a fixed reference point (RP) at the well near land surface that can be used to measure the height of the measuring point (MP) and can be surveyed if desired. Examples of the land surface reference point description are; a brass marker installed in the concrete pad, or an etched mark at the base of the surface casing. For ground-water sites, enter the altitude, in feet above the specific Vertical Datum, of the land surface at the site. For surface-water sites, enter the altitude of the floor of the gage house or the point of zero flow in the stream channel, in feet. Precision to two decimal places can be coded, if available. Altitudes below the specific Vertical Datum should be preceded by a minus sign (-). **Note : An entry of Altitude also requires the entry of C17 (Method Altitude Determined), C18 (Altitude Accuracy), and C22 (Altitude Datum).**

1.22 Altitude Accuracy

(SALTAC/C18 - CHAR X(3) -- alt_acy_va):

Altitude accuracy is **mandatory** when altitude is entered. 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”. Many altitudes are interpolated from the contours on topographic maps; accuracies determined in this way are generally entered as one-half of the contour interval.

1.23 Altitude Method

(SALTMT/C17 - CHAR(1)-- alt_meth_cd):

Enter the appropriate code for the method used to determine the altitude. When Altitude is entered, the code is *mandatory*. The codes and their descriptions are listed below.

Code	Description
A	Altimeter
D	Differential Global Positioning System (DGPS)
G	Global Positioning System (GPS)
I	Interferometric Synthetic Aperture Radar, airplane (IfSAR)
J	Light Detection And Ranging, airplane (LiDAR)
L	Level or other surveying method
M	Interpolated from topographic map
N	Interpolated from digital elevation model (DEM)
R	Reported
U	Unknown

1.24 Altitude Datum

(SALTDm/C22 - CHAR X(10) -- alt_datum_cd):

Altitude datum is *mandatory* when altitude is entered. For a complete current list and their valid codes see: /usr/opt/nwis/support/edit.tables/saltdm.edi.

The only vertical datums that can be converted on output are NGVD29 (National Geodetic Vertical Datum of 1929) and NAVD88 (North American Vertical Datum of 1988). NWIS uses the North American Vertical Datum Conversions (VERTCON) of the National Geodetic Survey to convert from NGVD29 to NAVD88 or vice-versa. Conversions to or from other vertical datums are not available.

1.25 Land-Net Location

(SLNDNT/C13 - CHAR X(23) -- land_net_ds):

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," 5th principal meridian = 5, Mt. Diablo meridian = M. The format for the Land-Net Location is generally determined by the reference list /usr/opt/nwis/support/edit.tables/slndnt.ovr. For changes to take effect, run option 15 in the gws_i_sys menu "Rebuild Edit Tables" Please refer to the [Database Administrator's Manual, section 1.13](#).

Below are examples of land net for legal descriptions and other scenarios formatted to fit the template:

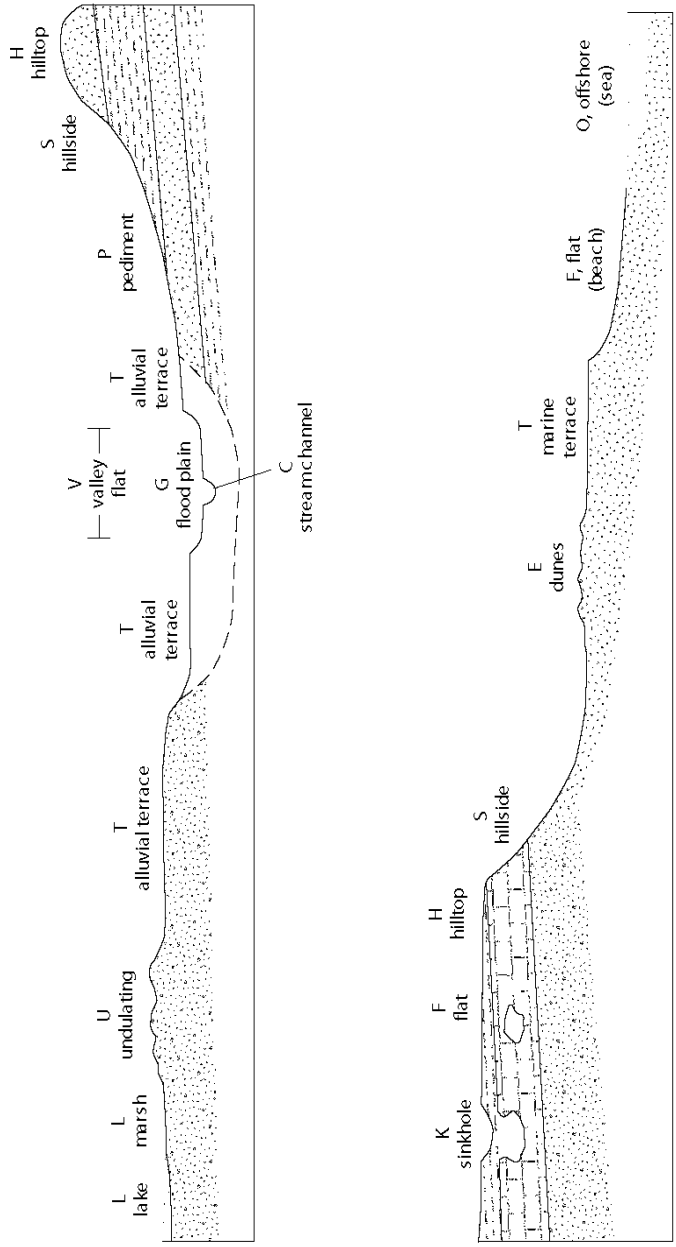
SWSWSWS31	T09S	R47E	
NESENES36	T09S	R40E	
NESEWS03	T12N	R29E	
MSENHS16	T13N	R19E	M-North half of the SE corner of section 16
CNSWS16	T13N	R19E	M-Center of the SW corner of section 16
02LTS16	T13N	R19E	M-Lot 2 of section 16
UNSERVS	T	R	-Unsurveyed
LNDGRTS	T	R	-Landgrant
SWSWSWS31	T34HN	R47E	M-Township 34½ North

1.26 Topographic-Setting Code (STOPO/C19 - CHAR X(1) -- topo_cd):

Enter 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. Allowable codes are listed below:

Code	Description
A	Alluvial fan
B	Playa
C	Stream channel
D	Local depression
E	Dunes
F	Flat surface
G	Flood plain
H	Hilltop
K	Sinkhole
L	Lake, swamp, or marsh
M	Mangrove swamp
O	Offshore (estuary)
P	Pediment
S	Hillside (slope)
T	Alluvial or marine terrace
U	Undulating
V	Valley flat (valleys of all sizes)
W	Upland draw

The figure on the next page is a diagrammatic sketch of the topographic features.



- (A) Alluvial fan refers to a low, outspread, relatively flat to gently sloping mass of loose rock material shaped like an open fan or a segment of a cone. It is deposited by a stream at a place where it issues from a narrow mountain valley upon a plain or broad valley.
- (B) Playa refers to a dried-up, vegetation-free, flat-floored area composed of thin, evenly stratified sheets of fine clay, silt or sand, and represents the bottom part of a shallow, completely closed or undrained desert lake basin in which water accumulates and is quickly evaporated, usually leaving deposits of soluble salts.
- (C) Stream 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.
- (D) A local depression 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.
- (E) Dunes refer 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.
- (F) A flat surface may be part of a larger feature, such as an upland flat, mesa or plateau, coastal plain, lake plain, or pediment terrace and valley flat, which are special varieties of flat surfaces, and are classified separately.
- (G) Flood plain refers to the surface or strip of relatively smooth land adjacent to a river channel, constructed by the present river in its existing regimen and covered with water when the river overflows its banks at times of high water.
- (H) A hilltop is the upper part of a hill or ridge above a well-defined break in slope. A site on the crest of an escarpment or top of a cuesta slope (see fig. 1) 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.
- (K) A sinkhole 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.
- (L) Lake 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 significant period of time.
- (M) Mangrove swamp refers to a tropical or subtropical marine swamp characterized by abundant mangrove trees.

- (O) Offshore refers to a site along a coast or estuary that is continuously submerged.
- (P) Pediment refers to a plain of combined erosion and deposition that forms at the foot of a mountain range.
- (S) A hillside 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 is not significant.
- (T) An alluvial or marine terrace is generally a flat surface usually parallel to, but elevated above, a stream valley or coastline. Characteristically, steep slopes or escarpments separate the terrace from an adjacent upland on one side, and a lowland (coast or valley) on the other. 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.
- (U) Undulating 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.
- (V) A valley flat is a low flat area between valley walls and bordering a stream channel. It includes the flood plain, and generally is the flattest 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 make the outer edge of the alluvial flat. Use this code for sites in small valleys on a plain, if the site taps alluvium or the valley situation has hydrologic significance.
- (W) An upland draw is a small natural drainageway or depression, usually dry, on a hillside or upland.

1.27 Hydrologic-Unit Code

(SHUC/C20 - SECONDARY-KEY CHAR X(16) -- huc_cd):

Enter the hydrologic-unit code for the cataloging unit in which the site is located. This eight-digit code consists of four parts:

- 1) Hydrographic region code
- 2) Subregion code designated by the Water Resources Council
- 3) Accounting unit within the National Water Data Network
- 4) Cataloging unit of the USGS's "Catalog of Information on Water Data"

State Hydrologic Unit maps delineating the hydrographic boundaries of these units are available from the following address:

**USGS Map Sales
Federal Center, Box 25286
Denver, Colorado 80225.**

If the site does not lie within a currently designated hydrologic unit (e.g., offshore wells), the eight-digit code 99999999 may be entered in this field.

1.28 Drainage-Basin Code

(SBASIN/C801 - SECONDARY-KEY CHAR X(2) -- basin_cd):

Enter a two-digit code that further subdivides the hydrologic-unit code (C20). This two-digit code is defined by the WSC.

1.29 Time Zone Code

(SMGTOF/C813 - MANDATORY CHAR X(6) -- tz_cd):

Enter the appropriate 2-5 character time zone code for the site location. This is a mandatory field; data will not be stored for this site if this field is blank. This field is validated by a reference list located at: /usr/opt/nwis/support/reflists/tz. A published version of this reference list is available in [Appendix J](#) of the QWDATA User Documentation.

1.30 Local Standard Time Flag

(SLSTFL/C814 - MANDATORY CHAR X(1) -- local_tm_fg):

Enter a 'Y' for yes or an 'N' for no to indicate whether the site is in an area that switches to Local Standard Time (Daylight Savings Time) for a part of the year. This is a mandatory field; data will not be stored for this site if this field is blank.

1.31 Location Map

(SMAP/C14 - CHAR X(20) -- map_nm):

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. The map names table can be accessed by using an sql statement. For example logged on as NWIS type:

```
tsql <databasename> "select distinct (map_nm) from sitefile_01" >> output filename
```

1.32 Map Scale

(SMSCAL/C15 - CHAR X(7) map_scale_fc):

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 enter the remaining number without the comma. A 7 1/2-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.

1.33 Agency Use of Site

(SUSE/C803 - SECONDARY-KEY CHAR X(1) -- agency_use_cd):

Enter a code for the agency (SAGNCY) use of site. Allowable codes are:

Code	Short Description	Long Description
A	Active - no/na	Active data collection site with undocumented or unneeded landowner agreement
L	Active - Written	Active data collection site with written landowner agreement (Form 9-1483)
M	Active - Oral	Active data collection site with memo documenting oral landowner agreement
I	Inactive Site	Inactive data collection site
R	Remediated	Discontinued and remediated site
D	Discontinued	Discontinued and non-remediated site
O	Inventory Site	Inventory data site only

Specific rules concerning the use of agency_use_cd have been established for sites owned by the USGS. These rules facilitate record keeping with respect to discontinued-station liability. For the requirements of the discontinued-station liability policy as it relates to NWIS, definitions and examples of USGS ownership, and proper use of agency_use_cd, see [US Geological Survey WRD Policy Memorandum 2009.02](#).

1.34 National Water-Use Code

(SNWUSE/C39 - CHAR X(2) -- nat_water_use_cd):

Select the National water-use code from the following list:

Code	Description
WS	Water supply
DO	Domestic
CO	Commercial
IN	Industrial
IR	Irrigation
MI	Mining
LV	Livestock
PH	Hydroelectric power generation
ST	Wastewater treatment

Code	Description
RM	Remediation
TE	Thermoelectric power water use
AQ	Aquaculture

- (WS) Water supply refers to water withdrawn by public and private water suppliers and delivered to various users. Water suppliers can be public suppliers (public or private water systems that provide water to at least 25 people or a minimum of 15 connections).
- (DO) Domestic refers to water for household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. This is also called residential water use.
- (CO) Commercial refers to water used by commercial facilities such as hotels, restaurants, office buildings, educational institutions, prisons, government and military facilities, and retail sales stores. For military bases and prisons, if domestic use cannot be determined, all withdrawals should go in the commercial category.
- (IN) Industrial water use includes water for such purposes as processing, washing, and cooling in facilities that manufacture products. Electric power generation, mining, and the extraction of crude petroleum and gases are included in other water use categories.
- (IR) Irrigation refers to artificial application of water on lands to assist in the growing of crops and pastures or to maintain vegetative growth in recreational lands such as parks and golf courses. Irrigation water may be either self-supplied or obtained from an irrigation supply system or irrigation district.
- (MI) Mining refers to water use for extracting minerals occurring naturally, including solids such as coal and ores, liquids such as crude petroleum, and gases such as natural gas. Mining also includes uses associated with quarrying, well operations, milling, and other preparations customarily done at the mine site or as part of a mining activity. Mining does not include uses in processing, such as smelting, refining petroleum, or slurry pipeline operations.
- (LV) Livestock water use is water used for livestock watering, feed lots, dairy operations, and other on-farm needs. Livestock includes all animals other than fish.
- (PH) Hydroelectric power generation refers to the use of water to generate electricity at plants where the turbine generators are driven by falling water.
- (ST) Wastewater treatment refers to the amount of water treated and released by facilities engaged primarily in the collection, treatment, and disposal of wastewater conveyed through a sewer system.
- (RM) Remediation water use is water that is either (1) pumped from a contaminated area to control the flow direction of contaminants in ground-water or (2) pumped, treated, and either used or returned to ground-water or surface-water.
- (TE) Thermoelectric power water use is water used in the process of generating thermoelectric power using fossil fuel, nuclear, or geothermal fuel sources. Thermoelectric power generation replaces the codes for fossil fuel thermoelectric generation (PF), nuclear thermoelectric power generation (PN), and geothermal thermoelectric power generation (PG).

(AQ) Aquaculture water use is water used for fish hatcheries and fish farms. Aquaculture replaces the code used for animal specialties (AS).

Although National water-use code is optional for all types of sites as far as the Sitefile is concerned, all sites for which water-use data will be stored in SWUDS are required to have a national water-use code populated. The allowable codes are dependent on type of site ([C802](#)). This dependency is explained in the following table.

NOTE: *Any type of site that is not represented in this table may or may not have any national water-use code associated with it, at the users discretion; SWUDS does not enforce any data-entry rules for types of sites not represented in this table. Types of sites that are represented in this table may have only the national water-use codes listed, if any at all, and no others.*

Type of site (see section 1.9)	Allowable National water-use codes (see table above)
LK	WS, IN, MI, LV, AQ
SP	WS, DO, CO, IN, MI, LV, AQ, IR, TE, ST, RM
GW, -CR, -EX, -HZ, -IW, -MW, -TH	WS, DO, CO, IN, MI, LV, AQ, IR, TE, ST, RM
SB-GWD	WS, DO, CO, IN, MI, LV, AQ, IR, ST, RM
AW	WS, DO, CO, IN, MI, LV, AQ, IR, TE, PH, ST
AG	WS, DO, CO, IN, MI, LV, AQ, IR, TE, ST, RM
AS	WS, DO, CO, IN, MI, LV, AQ, IR, TE, ST, RM
FA-CI	WS, DO, CO, IN, MI, LV, AQ, IR, TE, ST, RM
FA-CS, -SPS, -STS, -SEW, -WWD	ST
FA-DV, -OF, -WIW	WS, DO, CO, IN, MI, LV, AQ, IR, TE, ST, RM, PH
FA-FON	IR
FA-GC	CO, IR, ST
FA-HP	PH
FA-TEP	TE
FA-WWTP	ST, RM
FA-WDS	WS
FA-WTP	WS, RM
FA-WU	WS, DO, CO, IN, MI, LV, AQ, IR, TE, ST, PH

1.35 Type of Data Collected

(SDATA/C804 - 30-POSITION ARRAY CHAR X -- data_types_cd):

Code in the proper location or locations in the array, one (or more) of the following codes:

- A- Active data collection site
- I - Inactive or discontinued data collection site
- O - Inventory data site only

The following codes act as flags for the types of data collected:

Column on Screen	SDATA(30) 30*1	Types of data collected:
1	SDATA(1)	Stage or water levels--continuous
2	SDATA(2)	Stage or water levels--intermittent
3	SDATA(3)	Water quality--continuous
4	SDATA(4)	Water quality--intermittent
5	SDATA(5)	Precipitation--continuous
6	SDATA(6)	Precipitation--intermittent
7	SDATA(7)	Evaporation--continuous
8	SDATA(8)	Evaporation--intermittent
9	SDATA(9)	Wind velocity
0	SDATA(10)	Tide--continuous
A	SDATA(11)	Tide--intermittent
B	SDATA(12)	Sediment concentration
C	SDATA(13)	Sediment particle size
D	SDATA(14)	Peak flows
E	SDATA(15)	Low flows
F	SDATA(16)	Water Use
--	SDATA(17)-(30)	Unassigned

1.36 Instruments at Site

(SINST/C805 - 30-POSITION ARRAY CHAR(1) -- instruments_cd):

Enter a 'Y' for yes, leave blank for no instrument at site; multiple instruments can be identified for a site. For example: a 'Y' in position 1 designates the site has a digital recorder, and a 'Y' in position 14 shows that a tipping-bucket rain gage is also operating at the site.

Columns on Screen	SINST(30) 30*1	Flags-instrumentation installed at this site (code):
1	SINST(1)	Digital recorder
2	SINST(2)	Graphic recorder
3	SINST(3)	Telemetry--land line
4	SINST(4)	Telemetry--radio
5	SINST(5)	Telemetry--satellite relay
6	SINST(6)	AHDAS

Columns on Screen	SINST(30) 30*1	Flags-instrumentation installed at this site (code):
7	SINST(7)	Crest-stage gage
8	SINST(8)	Tide gage
9	SINST(9)	Deflection meter
0	SINST(10)	Bubble gage
A	SINST(11)	Stilling well
B	SINST(12)	CR-type recorder
C	SINST(13)	Weighing rain gage
D	SINST(14)	Tipping-bucket rain gage
E	SINST(15)	Acoustic velocity meter
F	SINST(16)	Electromagnetic flow meter
G	SINST(17)	Pressure Transducer
---	SINST(18)-(30)	Unassigned

1.37 Date Site Established or Inventoried
(SINVDT/C711 - CHAR X(8) -- inventory_dt):

Enter the date that the site was established or inventoried in the following format: MMDDYYYY (12011984). If the month or day is not known, enter blanks in the spaces. Use leading zeros for month or day values less than 10.

1.38 Remarks
(SREMRK/C806 - CHAR X(50) -- site_rmks_tx):

This field is designed for a significant remark about the site. If multiple remarks need storing, use the remarks record in the Miscellaneous File (See [Miscellaneous File Components – Chapter 2.5.](#))

1.39 Record Ready for Web
(SIWBFG/C32 - CHAR(1)—site_web_cd)

This field contains the status and availability of a record for display on the World Wide Web. Only records flagged with a ‘Y’ are made available on the Web. Codes Y and N are set by the NWIS software. **Note: The web ready code cannot be deleted from the database because it is automatically populated by the GWSI software.**

Code	Description
Y	Record has been checked and is ready for Web display.
C	Record has not been checked. No Web display.
N	Record has failed one or more data verification checks. No Web display.
P	Record is proprietary. No Web display.
L	Local use only. No Web display.

1.40 Data Reliability

(SCLASS/C3 – CONDITIONALLY MANDATORY CHAR(1) -- reliability_cd):

Data reliability code is mandatory for spring, groundwater, and aggregate groundwater sites. Enter the code indicating the reliability of the data available for the site. Data will not be stored for the site if this field is blank. The codes and their descriptions are:

Code	Description
C	Data have been field checked by the reporting agency.
L	Location not correct.
M	Minimal data.
U	Data have not been field checked by the reporting agency, but the reporting agency considers the data reliable.

Enter 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 that portrays the lesser confidence. (*Note: The codes are listed in order of decreasing confidence.*)

1.41 Date of First Construction

(SCONDT/C21 - CHAR X(8) -- construction_dt):

Enter the date when construction began. This is the most desirable date. If the date of construction is unavailable enter the earliest date for which data are available for the site or leave this field blank. The date stored is checked against dates for other data entered, and no data will be accepted if associated with an earlier date than that stored. If the month or day are not known, enter blanks in the spaces, and use leading zeros for month or day values less than 10. Enter four digits for the year.

1.42 Primary Use of Site

(SUSE1/C23 - MANDATORY (GROUND WATER) except Springs CHAR(1) -- site_use_1_cd):

Enter 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). If the site is used for more than one purpose, enter the principal use here and enter the subordinate uses in

the following two fields (secondary and tertiary). Data will not be stored for the site if this field is blank. The codes and their descriptions are:

Code	Description
A	Anode
C	Standby emergency supply
D	Drain
E	Geothermal
G	Seismic
H	Heat reservoir
M	Mine
O	Observation
P	Oil or gas well
R	Recharge
S	Repressurize
T	Test hole
U	Unused site
V	Withdrawal/Return
W	Withdrawal of water
X	Waste disposal
Z	Destroyed

- (A) Anode is a hole used as an electrical anode. Include in this category wells used solely to ground pipelines or electronic relays and other installations.
- (C) Standby emergency supply refers to a water-supply source that is used only when the principal supply of water is unavailable.
- (D) Drain refers to the drainage of surface water to the subsurface.
- (E) Geothermal 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.
- (G) Seismic hole is one drilled for seismic exploration. If it has been converted to water supply, it should be listed as "W-Withdrawal." A seismic hole used as an observation well should be coded as "O-Observation well."
- (H) Heat reservoir refers to a well in which a fluid is circulated in a closed system. Water is neither added to, nor removed from, the aquifer.
- (M) Mine includes any tunnel, shaft, or other excavation constructed for the extraction of minerals.
- (O) Observation well is a cased test-hole or well, drilled for either water-level or water-quality observations. Do not use this category for an oil-test hole, or water-supply well used only incidentally as an observation well.

- (P) Oil or gas well is any well or hole drilled in search of, or for production of, petroleum or gas. It 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).”
- (R) Recharge site is a site constructed or converted for use in replenishing the aquifer. Use this category for wells that are used to return water to the aquifer after use, such as those for returning air-conditioning water.
- (S) Repressurize 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.
- (T) Test hole 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 should be in this class.
- (U) An unused 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.
- (V) Ground-water sites that are used to both withdraw water from and inject water to a well, such as an irrigation well used to return water to the aquifer during nonpumping periods. The use of this site is to withdraw water, not for drainage or recharge.
- (W) Withdrawal of water 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.
- (X) A waste-disposal 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.
- (Z) A destroyed 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.

1.43 Secondary Site Use

(SUSE2/C301 - CHAR X(1) -- site_use_2_cd):

If the site is used for more than one purpose, show the secondary use here. Enter an appropriate code from the above list.

1.44 Tertiary Site Use

(SUSE3/C302 - CHAR X(1) -- site_use_3_cd):

If needed, a third use of the site can be shown here. Enter an appropriate code from the above list.

1.45 Primary Use of Water

(SWUSE1/C24 - SECONDARY-KEY CHAR X(1) -- water_use_1_cd):

Enter the code indicating the principal use of water from the site. If water from the site is used for more than one purpose, enter the principal use here and enter the subordinate uses in the following two fields. The codes and their descriptions are:

Code	Description
A	Air conditioning
B	Bottling
C	Commercial
D	Dewater
E	Power generation
F	Fire protection
H	Domestic
I	Irrigation
J	Industrial (cooling)
K	Mining
M	Medicinal
N	Industrial
P	Public supply
Q	Aquaculture
R	Recreation
S	Stock supply
T	Institutional
U	Unused
Y	Desalination
Z	Other (explain)

- (A) Air-conditioning 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.
- (B) Bottling refers to water that is bottled for potable purposes (see Medicinal).
- (C) Commercial 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.
- (D) Dewatering refers to water 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.
- (E) Power generation refers to use of water for generation of any type of power. Water for cooling and boiler make-up water are included.

- (F) Fire protection 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 public supply, to irrigate a golf course, fill a swimming pool, or for other use.
- (H) Domestic 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.
- (I) Irrigation 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. Water used to irrigate golf courses or park lands is also coded as Irrigation.
- (J) Industrial cooling refers to a water supply used solely for cooling industrial machines.
- (K) Mining refers to a water supply used solely for mining purposes.
- (M) Medicinal 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.
- (N) Industrial 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.
- (P) Public Supply 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, as four or less 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. **Note: This definition differs from the public supply definition in C39, national water-use code, and C350, water-use owner type, both of which adhere to the EPA definition of at least 25 people or 15 service connections.**
- (Q) Aquaculture refers to a water supply used solely for aquaculture, such as fish farms.
- (R) Recreation 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. Water used to irrigate golf courses is coded as “I-Irrigation.”
- (S) Stock Supply refers to the watering of livestock.
- (T) Institutional 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.
- (U) Unused means water is not being removed from the site for one of the purposes 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.

- (Y) Desalination refers to water used in a desalting process whereby dissolved solids are removed to make water potable or suitable for other uses. Enter the type of use of the desalinated water in the next column, "Secondary Water Use."
- (Z) Other refers to miscellaneous uses not included in the listed categories. Explain other use of water in miscellaneous remarks record.

1.46 Secondary Use of Water

(SWUSE2/C25 - CHAR X(1) -- water_use_2_cd):

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.

1.47 Tertiary Use of Water

(SWUSE3/C26 - CHAR X(1) -- water_use_3_cd):

If needed, a third use of water from the site can be shown here. Enter an appropriate code from the list above.

1.48 Aquifer Type Code

(SAQTYP/C713 - CHAR X(1) -- aqfr_type_cd):

Enter the appropriate code to describe the type of aquifer(s) penetrated by the well.

Code	Aquifer Type
U	Unconfined single aquifer
N	Unconfined multiple aquifers
C	Confined single aquifer
M	Confined multiple aquifer
X	Mixed (confined and unconfined multiple aquifers)

1.49 Primary Aquifer

(SAQUFR/C714 - SECONDARY-KEY CHAR X(8) -- aqfr_cd):

Enter the eight-character code identifying the primary aquifer unit from which the water is obtained. Aquifer codes are available in the online file:

/usr/opt/nwis/support/aageol.all.states. The procedure for requesting an update to the aquifer code reference list is available at <http://water.usgs.gov/ogw/geoh-code-procedure.html>.

1.50 National Aquifer Code

(SNAQCD/C715 - CHAR X(10) – nat_aqfr_cd):

Enter the ten-character code identifying that national aquifer (principal aquifer) from which water is obtained. National aquifers are the principal aquifer or aquifer systems in the United States, defined as regionally extensive aquifers or aquifer systems that have the potential to be used as a source of potable water. Not all local aquifers as coded in C714 (aqfr_cd), primary aquifer, are a part of the national aquifer. Wells completed in these local aquifers can be coded as N9999OTHER. National aquifer codes and names, with links to descriptions on the Aquifer Basics or Ground Water Atlas Web sites and to GIS coverages when available, are on the following Web page:

<http://water.usgs.gov/ogw/NatAqCode-reflist.html>.

1.51 Hole Depth

(SHDEPT/C27 - CHAR X(8) -- hole_depth_va):

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, interconnected wells, ponds, tunnels, or drains, leave the space blank and enter the data into the Miscellaneous Special-Cases Record, [Section 5.10.9](#).

1.52 Well Depth

(SWDEPT/C28 - CHAR X(8) -- well_depth_va):

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 practical, enter the reported depth at which the well was finished.

This field should be completed for wells whenever possible. If the hole depth is given, no other depth may be entered for the site that is greater than the hole depth. If well depth is entered no water level may be entered for the site that is greater than well depth. If no well depth is entered, but a hole depth is entered no water level for the site may be entered that is greater than hole depth. Precision may be carried to two decimal places.

1.53 Source of Depth Data

(SWDSRC/C29 - CHAR X(1) -- depth_src_cd):

Enter an appropriate code to indicate how the information about the depth of the well was obtained. The codes and their descriptions are:

Code	Description
A	Reported by another government agency. Do not use A if the reporting agency is the owner of the well--use O.
D	From driller's log or report.
G	Private geologist-consultant or university associate.
L	Depth interpreted from geophysical logs by personnel of source agency.

Code	Description
M	Memory (owner, operator, driller): less reliable than O – reported by owner.
O	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).

1.54 Drainage Area

(SAREA/C808 - CHAR X(8) -- drain_area_va):

Enter the total area of the drainage basin of a lake, stream, wetland, or estuary site, in square miles. If the value contains a fractional part of a square mile, the decimal point must be entered.

1.55 Contributing Drainage Area

(SCNTRB/C809 - CHAR X(8) -- contrib_drain_area_va):

Enter the contributing drainage area of a lake, stream, wetland, or estuary site, in square miles. This item should be entered only if the contributing area is different from the total drainage area. This situation can occur when part of the drainage area consists of very porous soil or depressions that either allow all runoff to enter the ground water or traps the water in ponds so that rainfall does not contribute to runoff. A transbasin diversion can also affect the total drainage area.

1.56 Other Ground-Water Data Files

(SGWFLE/C712 - MANDATORY FOR GROUND-WATER 30-POSITION
ARRAY CHAR X -- gw_file_cd):

This field is automatically set by the EDIT/UPDATE program and reflects the availability of other ground-water data. This component appears in dump format output but may not be meaningful. The contents of this field should be used with great caution:

Y -- Yes, file exists.

N -- No, file does not exist.

SGWFLE(20) 20*1 Data in other ground-water files:

SGWFLE(1) Construction (GW.CONNS) data for site

SGWFLE(2) Miscellaneous (GW.MISC) data for site

SGWFLE(3) Discharge (GW.DISC) data for site

SGWFLE(4) Geohydrologic (GW.GEOH) data for site

SGWFLE(5) Hydraulic (GW.HYDR) data for site

SGWFLE(6) Water-level (GW.LEV) data for site

SGWFLE(7) Observation-heading (GW.OBS) data for site

SGWFLE(8)-(20) Unassigned

Section 2. Construction Record Components

Sub- Section	Description
2.1	Source agency code (C4) MANDATORY
2.2	Site identification number (C1)MANDATORY
2.3	Record type (see below) MANDATORY
2.4	Record sequence number MANDATORY
2.5	Record sequence number of child MANDATORY
2.6	Person creating record
2.7	Date and time created
2.8	Person updating record
2.9	Date and time of last update
2.10	Record ready for Web
2.11	Remainder of record (depend on record type)

The CONSTRUCTION record is used to store data about the construction of the well. These data are grouped into eight sub-records as shown in the following table. 'Record Types HOLE, CSNG, and OPEN are 'Child' records associated with a 'Parent' CONS record which must be entered before the 'Child' records may be entered.

Record Type	Description of Contents	Data Table Name
CONS	Includes basic construction data	(gw_cons_##)
HOLE	Includes hole data	(gw_hole_##)
CSNG	Includes casing data	(gw_csng_##)
OPEN	Includes openings data	(gw_open_##)
LIFT	Includes lift, major pump, and standby pump	(gw_lift_##)
REPR	Includes minor repairs data	(gw_repr_##)
SPNG	Includes spring data	(gw_spng_##)
MPNT	Includes measuring-point data	(gw_mpnt_##)

The Primary Key for all Construction Record Types contains Source Agency, Site ID number, Record Type, a Record Sequence Number, and in the case of Record Types HOLE, CSNG, and OPEN, a Parent Sequence number that ties them to the Parent CONS Record.

2.1 Source Agency

(CDAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

This is the agency that is the source of the site data. The Source Agency Code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. For a detailed description see [Section 1.1](#).

2.2 Site Identification Number

(CDID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

This is the 2 to 15-digit site identification (Site ID) number of the site to which the construction data applies. If the site has not been entered into the Sitefile, this operation

must be completed before the construction data are input. The Site ID number is mandatory and a part of the primary key. For a detailed description see [Section 1.2](#).

2.3 Record Type

(CDRTYP - MANDATORY SECONDARY-KEY CHARX(4)):

The RECORD TYPE identifies the category of data included in the record. The eight CONSTRUCTION Record Types are as follows:

Record Type	Description	Types of Sites Allowed (see section 1.9)
CONS	Construction record (C754)	All but ST
HOLE	Hole record (C756)	GL, OC, LK, GW, SB, LA, WE, ES, FA-SPS, FA-WIW
CSNG	Casing record (C758)	GW, SB, LA, FA- (all)
OPEN	Openings record (C760)	GW, SB, LA, FA- (all)
LIFT	Lift record (C752)	All but AT, GL, AG, AS, AW
REPR	Repairs record (C762)	SP, GW, SB, LA, FA- (all)
SPNG	Spring record (C764)	SP
MPNT	Measuring-point record (C766)	All but AT, GL, OC, AG, AS, AW

2.4 Record Sequence Number or Sequence Number of Parent (CDRNUM - MANDATORY PRIMARY-KEY CHAR X(3)):

The record sequence number or sequence number of parent (HOLE, CSNG, OPEN sub-records) is assigned at the time of data entry to keep data by record type in a logical order. This number is mandatory and a part of the primary key. The component number for the record sequence number depends on the record type as follows:

Record	Description	Attribute Name
CONS	Construction record (C723)	cons_seq_nu
HOLE	Parent construction record (C59)	cons_seq_nu
CSNG	Parent construction record (C901)	cons_seq_nu
OPEN	Parent construction record (C902)	cons_seq_nu
LIFT	Lift record (C254)	lift_seq_nu
REPR	Repairs record (C165)	repr_seq_nu
SPNG	Spring record (C727)	spng_seq_nu
MPNT	Measuring-point record (C728)	mpnt_seq_nu

A parent CONS record must be established before HOLE, CSNG, or OPEN sub-record can be entered. HOLE, CSNG, or OPEN sub-records are identified using Parent Sequence number, which relates the sub-record to the appropriate CONS record, and Record Sequence Number for the sub or 'child' record. For example, enter the sequence number (C723) of the construction (CONS) record to which the CSNG record is to be related. The CONS sequence number (C723) is the parent sequence number of HOLE, CSNG, and OPEN records, and relates the CSNG data to the proper construction record.

This entry is mandatory; no information about the casing will be stored without a valid value for this field.

2.5 Record Sequence Number of Child Record

(for HOLE, CSNG, & OPEN only)

(CDCRNM - MANDATORY CHAR X(3)):

Enter the sequence number of the child record. This number is assigned at the time of data entry to keep data by record type in a logical order; it is mandatory and a part of the primary key. Data for the site will not be stored if this field is blank.

Record	Description	Attribute Name
HOLE	Hole record (C724)	hole_seq_nu
CSNG	Casing record (C725)	csng_seq_nu
OPEN	Openings record (C726)	open_seq_nu

2.6 Person Creating Record

(CDCUID - CHAR X(8)):

This field contains the user identification of the person creating the record. User identification of the person creating the construction is entered automatically by the NWIS software.

Record	Description	Attribute Name
CONS	Construction record (C403)	cons_cn
HOLE	Hole record (C406)	hole_cn
CSNG	Casing record (C409)	csng_cn
OPEN	Openings record (C412)	open_cn
LIFT	Lift record (C415)	lift_cn
REPR	Repairs record (C418)	repr_cn
SPNG	Spring record (C421)	spng_cn
MPNT	Measuring-point record (C424)	mpnt_cn

2.7 Date and Time Created

(CDCRDT/C404 - CHAR X(14)):

This field contains the date and time that the construction record was created. The date and time are entered automatically by the NWIS software.

Field	Component	Attribute Name
CONS	Construction record (C404)	cons_cr
HOLE	Hole record (C407)	hole_cr
CSNG	Casing record (C410)	csng_cr
OPEN	Openings record (C413)	open_cr
LIFT	Lift record (C416)	lift_cr
REPR	Repairs record (C419)	repr_cr
SPNG	Spring record (C422)	spng_cr
MPNT	Measuring-point record (C425)	mpnt_cr

2.8 Person Updating Record (CDUUIID/C405 - CHAR X(8)):

This contains the user identification (User ID) of the person updating the construction record. The user ID is entered automatically by the NWIS software.

Record	Description	Attribute Name
CONS	Construction record (C405)	cons_mn
HOLE	Hole record (C408)	hole_mn
CSNG	Casing record (C411)	csng_mn
OPEN	Openings record (C414)	open_mn
LIFT	Lift record (C417)	lift_mn
REPR	Repairs record (C420)	repr_mn
SPNG	Spring record (C423)	spng_mn
MPNT	Measuring-point record (C426)	mpnt_mn

2.9 Date and Time of Last Update (CDUPDT/C755 - CHAR X(14)):

This contains the date and time that the construction record was last updated. The date and time are entered automatically by the NWIS software.

Record	Description	Attribute Name
CONS	Construction record (C755)	cons_md
HOLE	Hole record (C757)	hole_md
CSNG	Casing record (C759)	csng_md
OPEN	Openings record (C761)	open_md
LIFT	Lift record (C753)	lift_md
REPR	Repairs record (C763)	repr_md
SPNG	Spring record (C765)	spng_md
MPNT	Measuring-point record (C767)	mpnt_md

2.10 Record Ready for Web (CDWBFG/C850 - SK7 - CHAR X):

This field contains the status and availability of a record for display on the World-Wide-Web. The codes and their descriptions are:

Code	Description
Y	Yes-Record has been checked and is ready for Web display.
C	Conditional-Record has not been checked. No Web display.
P	Proprietary Record. No Web display.
L	Local use only. No Web display.

Record	Description	Attribute Name
CONS	Construction record (C850)	cons_web_cd
HOLE	Hole record (C851)	hole_web_cd
CSNG	Casing record (C852)	csng_web_cd
OPEN	Openings record (C853)	open_web_cd
LIFT	Lift record (C854)	lift_web_cd
REPR	Repairs record (C855)	repr_web_cd
SPNG	Spring record (C856)	spng_web_cd
MPNT	Measuring-point record (C857)	mpnt_web_cd

2.11 Data Dependent on Record Type

2.11.1 Construction Record -- CDRTYP = CONS

Data elements common to all Construction Data Records for CONS Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

Source agency	Site identification number
Record type (CONS)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update
Record ready for Web	

The entry of construction data is identified by coding "CONS" for the type of construction record. The CONS components are entered as follows:

Sub-Section	Attribute Name	Description
2.11.1.1	cons_dt	Date of construction (C60)
2.11.1.2	cons_contractor_nm	Name of contractor (C63)
2.11.1.3	cons_src_cd	Source of construction data (C64)
2.11.1.4	cons_meth_cd	Method of construction (C65)
2.11.1.5	finish_cd	Type of finish (SK5) (C66)
2.11.1.6	seal_cd	Type of seal (C67)
2.11.1.7	seal_depth_va	Depth to bottom of seal (C68)
2.11.1.8	dev_meth_cd	Method of development (C69)
2.11.1.9	dev_du	Hours of development (C70)
2.11.1.10	special_treat_cd	Special treatment (C71) during development

2.11.1.1 Date of Completed Construction (CDCODT/C60 - SK4 - CHAR X(8) -- cons_dt):

Enter the date on which the work was completed. If the day or month is not known, enter blanks in the spaces. Use leading zeros for values of day and month less than ten, and specify all four digits for the year. For many sites, this date will be the same as the one entered earlier as date of first construction (C21); however, it must be entered here.

**2.11.1.2 Name of Contractor/Driller
(CDCOCT/C63 - CHAR X(12) -- cons_contractor_nm):**

Enter the name of the individual or company that did the work. If needed to fit the space, use meaningful abbreviations or acronyms for company names.

**2.11.1.3 Source of Construction Data
(CDCOSC/C64 - CHAR X(1) -- cons_src_cd):**

Enter the code that best indicates the source of construction data or who furnished the data. The codes are the same as those used for Source of Depth Data. The codes and their descriptions are:

Code	Description
A	Reported by another government agency. Do not use A if the reporting agency is the owner of the well--use O .
D	From driller's log or report.
G	Private geologist-consultant or university associate.
L	Depth interpreted from geophysical logs by personnel of source agency.
M	Memory (owner, operator, driller): less reliable than O – reported by owner.
O	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).

**2.11.1.4 Method of Construction
(CDCOME/C65 - CHAR X(1) -- cons_meth_cd):**

Enter the code that best indicates the method by which the site was constructed. Allowable codes are:

Code	Description	Code	Description
A	Air-rotary	R	Reverse rotary
B	Bored or augered	S	Sonic
C	Cable-tool	T	Trenching
D	Dug	V	Driven
H	Hydraulic rotary	W	Drive and wash
J	Jetted	Z	Other (explain in remarks)
P	Air percussion		

- (A) Air-rotary method is one in which a stream of air is used to cool the bit and bring the rock cuttings to the surface.
- (B) A bored or augered 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.
- (C) Cable-tool 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.

- (D) Dug holes are excavated by hand tools or power-driven digging equipment. 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.
- (H) The hydraulic-rotary 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 drilling stem. Cuttings are carried to the surface in the annular space between the drilling stem and the wall of the hole. Note that separate categories are provided for air-rotary and reverse-rotary.
- (J) Jetted 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 unconsolidated material.
- (P) An air-percussion drill is a cutting tool powered by compressed air. It 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.
- (R) Reverse rotary 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.
- (S) Sonic Method where the drill stem and sampler barrel are vibrated to advance through the substrate.
- (T) Trenching refers to the construction of a sump or open pit from which groundwater may be pumped. Trenching may be done by hand, but more commonly power equipment such as a bulldozer, dragline power shovel, or a backhoe is used. Ponds and drains belong in this category of construction.
- (V) Driven 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 power equipment. An essential feature of a driven well is that no earth material is removed as the well is constructed.
- (W) Drive and wash 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.

2.11.1.5 Type of Finish

(CDCOF/C66 - SK5 - CHAR X(1) -- finish_cd):

Enter the code indicating the method of finish or the nature of the openings that allow water to enter the well. Allowable codes are listed on the following page:

Code	Finish/Openings	Code	Finish/Openings
C	Porous concrete	S	Screen
F	Gravel pack w/perforations	T	Sand point
G	Gravel pack w/screen	W	Walled
H	Horizontal gallery	X	Open hole
O	Open end	Z	Other (explain in remarks)
P	Perforated or slotted		

- (C) Porous concrete is concrete casing that is pervious enough to allow groundwater to seep into the well.
- (F & G) A gravel-pack 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 slotted casing.
- (H) A horizontal gallery or collector essentially is a horizontal type well in which the screen, slotted pipe, or gravel-filled trench is horizontal. All horizontal wells should be in this class, including Ranney collectors and infiltration galleries.
- (O) An open-end 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.
- (P) Perforated or slotted casing is well pipe that has had holes punched or slots cut in it to admit water. Do not use this designation if the well has a gravel pack. Use ‘F’ instead.
- (S) Screen 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. Do not use this designation if the well also has a gravel pack. Use ‘G’ instead.
- (T) A sand point is the screen part of a drive point and usually is part of a driven well.
- (W) A walled or shored 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 even a few feet of cribbing, corrugated pipe, or other shoring to prevent caving, should be in this category.
- (X) An open-hole well is one that has a 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.

2.11.1.6 Type of Seal

(CDCOSL/C67 - CHAR X(1) -- seal_cd):

Enter the code indicating the type of material used to seal the well against the entry of surface water. Allowable codes are:

Code	Material Used
B	Bentonite
C	Clay or cuttings
G	Cement grout
N	None
Z	Other (explain in remarks)

2.11.1.7 Depth to Bottom of Seal
(CDCOSD/C68 - CHAR X(4) -- seal_depth_va):

Enter the depth to the bottom of the seal, in feet below land surface, to the nearest foot.

2.11.1.8 Method of Development
(CDCODM/C69 - CHAR X(1) -- dev_meth_cd):

Enter the code indicating the method used to develop the well. The codes and their descriptions are:

Code	Method	Code	Method
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)

2.11.1.9 Hours of Development
(CDCODV/C70 - CHAR X(3) -- dev_du):

Enter the number of hours that the well was bailed, pumped, and so forth, for development.

2.11.1.10 Special Treatment During Development
(CDCOST/C71 - CHAR X(1) -- special_treat_cd):

Enter the code indicating any special treatment that was applied during development of the well. The codes and their descriptions are:

Code	Description	Code	Description
C	Chemical (acid, and so forth)	H	Hydrofracturing
D	Dry ice	M	Mechanical abrasion
E	Explosives	Z	Other (explain in remarks)
F	Deflocculent		

2.11.2 Hole Record -- CDRTYP = HOLE

Data elements common to all Construction Data Records for HOLE Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- | | |
|---------------------------------|---|
| Source agency | Site identification number |
| Record type (HOLE) | Record sequence number or sequence number of parent |
| Record sequence number of child | Person creating record |
| Date and time created | Person updating record |
| Date and time of last update | Record ready for Web |

The entry of hole data is identified by coding "**HOLE**" for the type of construction record. The HOLE components are entered as follows:

Sub-Section	Attribute Name	Description
2.11.2.1	hole_top_va	Depth to top of this interval (C73) MANDATORY
2.11.2.2	hole_bottom_va	Depth to bottom of this interval (C74)
2.11.2.3	hole_dia_va	Diameter of this interval (C75)

**2.11.2.1 Depth to Top of Interval
(CDHTOP/C73 - MANDATORY CHAR X(8) -- hole_top_va):**

Enter the depth to the point where this section of hole begins, in feet below land surface. The first section of hole always begins at depth 0. This value is mandatory so data for the site will not be stored if this field is blank.

**2.11.2.2 Depth to Bottom of Interval
(CDHBOT/C74 - CHAR X(8) -- hole_bottom_va):**

Enter the depth to the bottom of the hole segment, in feet below land surface.

**2.11.2.3 Diameter of Interval
(CDHDIA/C75 - CHAR X(5) -- hole_dia_va):**

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.

2.11.3 Casing Record -- CDRTYP = CSNG

Data elements common to all Construction Data Records for CSNG Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

Source agency	Site identification number
Record type (CSNG)	Record sequence number or sequence number of parent
Record sequence number of child	Person creating record
Date and time created	Person updating record
Date and time of last update	Record ready for Web

The entry of casing data is identified by coding "CSNG" for the type of construction record. The CSNG components are entered as follows:

Sub- Section	Component Name	Description
2.11.3.1	csng_top_va	Depth to top of this casing interval (C77)MANDATORY
2.11.3.2	csng_bottom_va	Depth to bottom of this casing interval (C78)
2.11.3.3	csng_dia_va	Diameter of this casing interval (SK6) (C79)
2.11.3.4	csng_material_cd	Casing material (C80)
2.11.3.5	csng_thick_va	Casing thickness (C81)

2.11.3.1 Depth to Top of Casing**(CDCSTP/C77 - MANDATORY CHAR X(8) -- csng_top_va):**

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 mandatory; the casing information will be rejected if a value is not specified.

2.11.3.2 Depth to Bottom of Casing**(CDCSBT/C78 - CHAR X(8) -- csng_bottom_va):**

Enter the depth to the bottom of this section of casing, in feet below land surface.

2.11.3.3 Diameter of Casing**(CDCSDI/C79 - SK6 - CHAR X(5) -- csng_dia_va):**

Enter the inside diameter of this section of casing, in inches. Two decimal places are provided for fraction sizes (1 1/4 = 1.25).

2.11.3.4 Casing Material**(CDCSMT/C80 - CHAR X(1) -- csng_material_cd):**

Enter the code indicating the material from which the casing is made. The codes and their descriptions are:

Code	Description	Code	Description
A	ABS	P	PVC or Plastic
B	Brick	Q	FEP
C	Concrete	R	Rock or Stone
D	Copper	S	Steel
E	PTFE	T	Tile
F	Fiberglass	U	Coated Steel
G	Galvanized Iron	V	Stainless Steel
H	Fiberglass Plastic	W	Wood
I	Wrought Iron	X	Steel Carbon
J	Fiberglass Epoxy	Y	Steel-Galvanized
K	PVC Threaded	Z	Other Material
L	Glass	4	Stainless 304
M	Other Metal	6	Stainless 316
N	PVC Glued		

2.11.3.5 Casing Thickness**(CDCSTK/C81 - CHAR X(6) -- csng_thick_va):**

Enter the thickness of the casing wall, in inches. Three decimal places are provided.

2.11.4 Openings Record -- CDRTYP = OPEN

Data elements common to all Construction Data Records for OPEN Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

- Source agency
- Site identification number
- Record type (OPEN)
- Record sequence number or sequence number of parent
- Record sequence number of child
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The entry of openings data is identified by coding “**OPEN**” for the type of construction record. The OPEN components are entered as follows:

Sub-Section	Component Name	Description
2.11.4.1	open_top_va	Depth to top of this open interval (C83) MANDATORY
2.11.4.2	open_bottom_va	Depth to bottom of this open interval (C84)
2.11.4.3	open_dia_va	Diameter of this open interval (C87)
2.11.4.4	open_material_cd	Material in this interval (C86)
2.11.4.5	open_cd	Type of openings in this interval (C85) MANDATORY
2.11.4.6	open_len_va	Length of openings (C89)
2.11.4.7	open_width_va	Width of openings (C88)

2.11.4.1 Depth to Top of Opening Interval (CDOTOP/C83 - MANDATORY CHAR X(8) -- open_top_va):

Enter the depth to the top of the open section, in feet below land surface. This field is mandatory; information about the open interval will not be stored if this field does not contain a valid entry.

2.11.4.2 Depth to Bottom of Opening Interval (CDOBOT/C84 - CHAR X(8) -- open_bottom_va):

Enter the depth to the bottom of the open section, in feet below land surface.

2.11.4.3 Diameter of Opening Interval (CDODIA/C87 - CHAR X(5) -- open_dia_va):

Enter the inside diameter, in inches, of perforated or slotted pipe, the diameter of a screen, or the diameter of the hole, if the well is finished open-hole.

2.11.4.4 Material Type**(CDOMAT/C86 - CHAR X(1) -- open_material_cd):**

Enter the code indicating the type of material from which the screen or other open section is made. The codes and their descriptions are:

Code	Description	Code	Description
A	ABS	N	PVC Glued
B	Brass/Bronze	P	PVC
C	Concrete	Q	FEP
D	Ceramic	R	Stainless Steel
E	PTFE	S	Steel
F	Fiberglass	T	Tile
G	Galvanized iron	V	Brick
H	Fiberglass Plastic	W	Membrane
I	Wrought iron	X	Steel Carbon
J	Fiberglass Epoxy	Y	Steel-Galvanized
K	PVC Threaded	Z	Other
L	Glass	4	Stainless 304
M	Other Metal	6	Stainless 316

2.11.4.5 Type of Opening**(CDOTYP/C85 - MANDATORY CHAR X(1) -- open_cd):**

Enter the code indicating type of open section. The codes and their descriptions are:

Code	Description	Code	Description
F	Fractured rock	S	Screen, type not known
L	Louvered or shutter-type	T	Sand point screen
M	Mesh screen	W	Walled or shored
P	Perforated, porous, or slotted casing	X	Open hole
R	Wire-wound screen	Z	Other (explain in remarks)

This field is mandatory; information about the openings will not be stored if this field is blank.

2.11.4.6 Length of Opening**(CDOLEN/C89 - CHAR X(6) -- open_len_va):**

Enter the long dimension of perforations or slots, in inches. This refers to the individual openings in the screen or slotted pipe.

2.11.4.7 Width of Opening**(CDOWID/C88 - CHAR X(6) -- open_width_va):**

Enter the short dimension of perforations or slots, or the mesh size of screens, in inches.

2.11.5 Lift Record -- CDRTYP = LIFT

Data elements common to all Construction Data Records for LIFT Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

Source agency	Site identification number
Record type (LIFT)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update
Record ready for Web	

The entry of lift data is identified by coding “LIFT” for type of construction record. Enter the LIFT components as follows:

Sub-Section	Attribute Name	Description
2.11.5.1	lift_cd	Type of lift (C43) MANDATORY
2.11.5.2	lift_dt	Date this lift was installed or recorded (C38)
2.11.5.3	intake_depth_va	Depth to intake (C44)
2.11.5.4	power_cd	Type of power (C45)
2.11.5.5	hp_va	Horsepower rating (C46)
2.11.5.6	manufacturer_nm	Manufacturer of lift device (C48)
2.11.5.7	serial_no_va	Serial number of lift device (C49)
2.11.5.8	power_co_nm	Name of power company (C50)
2.11.5.9	power_co_acct_va	Power-company account number (C51)
2.11.5.10	power_meter_va	Power-meter number (C52)
2.11.5.11	pump_rating_fc	Pump rating (C53)
2.11.5.12	add_lift_va	Additional lift (above land surface (C255)
2.11.5.13	maintainer_nm	Name of company that maintains the lift (C54)
2.11.5.14	capacity_va	Rated pump capacity (C268)
2.11.5.15	standby_cd	Type of standby power (C56)
2.11.5.16	standby_hp_va	Horsepower of standby power source (C57)

2.11.5.1 Type of Lift

(CDLTYP/C43 - MANDATORY SECONDARY-KEY CHAR X(1) -- lift_cd):

Enter the code indicating the type of pump or lift. This entry is mandatory; lift data will not be stored if this field is blank. Allowable codes are:

Code	Description	Code	Description
A	Air lift	S	Submergible pump
B	Bucket	T	Turbine pump
C	Centrifugal pump	U	Unknown
J	Jet pump	X	No lift
P	Piston pump	Z	Other (explain in remarks)
R	Rotary pump		

- (A) Air lift 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.
- (B) Bucket includes the familiar "rope and bucket," chain and bucket lifts, and the small bailer lifted by a rope or chain and pulley.
- (C) Centrifugal pumps have rotating impellers in a closed chamber that draw 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.
- (J) Jet pumps have 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.
- (P) Piston pumps include the familiar lift and pitcher pumps common in many rural areas. The old "reciprocating" pumps and the "deep-well with walking-beam jacks" are of the piston type.
- (R) Rotary pumps 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.
- (S) A submersible 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.
- (T) Turbines are of several types and may be 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 high-capacity wells for public, industrial, or irrigation supply.
- (U) Use unknown only if the site is equipped with a pump about which other data are available, but the type of pump cannot be identified.
- (X) No lift was present at the time of the visit.
- (Z) Other. Place in this category any lifting device that does not belong in one of the other categories. Examples are: helical rotor, hydraulic ram, and siphon.

2.11.5.2 Date Lift Installed or Recorded (CDLDAT/C38 - CHAR X(8) -- lift_dt):

Enter the date on which the lift data were collected. If the day and/or month are not known, enter blanks in the spaces. Use leading zeros for month or day less than ten, and specify all four digits for the year.

2.11.5.3 Depth to Intake**(CDLINT/C44 - CHAR X(5) -- intake_depth_va):**

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.

2.11.5.4 Type of Power**(CDLPWR/C45 - CHAR X(1) -- power_cd):**

Enter the code indicating the type of power used to power the pump. The codes and their descriptions are:

Code	Description	Code	Description
D	Diesel engine	L	LP gas (propane or butane engine)
E	Electric motor	N	Natural-gas engine
G	Gasoline engine	W	Windmill
H	Hand	Z	Other (explain in remarks)

2.11.5.5 Horsepower Rating**(CDLHPR/C46 - SECONDARY-KEY CHAR X(7) -- hp_va):**

Enter the horsepower rating of the primary power source. Two decimal places are provided for small motors.

2.11.5.6 Manufacturer of Lift Device**(CDLMFR/C48 - CHAR X(12) -- manufacturer_nm):**

Enter the name of the company that manufactured the pump. Use meaningful abbreviations or acronyms if needed to fit the space.

2.11.5.7 Serial Number of Lift Device**(CDLSER/C49 - CHAR X(12) -- serial_no_va):**

Enter the serial number of the pump.

2.11.5.8 Name of Power Company**(CDLPCO/C50 - CHAR X(12) -- power_co_nm):**

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.

2.11.5.9 Power Company Account No.**(CDLACT/C51 - CHAR X(10) -- power_co_acct_va):**

Enter the account number under which the power company stores information on power consumption at the site.

2.11.5.10 Power Meter No.

(CDLMTR/C52 - CHAR X(12) -- power_meter_va):

Enter the meter number of the electric or gas meter which records the power consumption of the pump.

2.11.5.11 Pump Rating

(CDLCNS/C53 - CHAR X(8) -- pump_rating_fc):

Enter the rating of the pump as 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, depending upon the type of power coded under "lift data" above. (If the volume of water pumped is measured in other units, i.e., feet or metric units, convert to millions of gallons.)

2.11.5.12 Additional Lift

(CDLADL/C255 - CHAR X(3) -- add_lift_va):

Enter the additional head (above land-surface datum) against which the pump works, in feet of water. For a sprinkler system for irrigation, this is the height of the sprinklers above land-surface datum plus the pressure at the sprinklers (in feet of water).

2.11.5.13 Person or Company Who Maintains the Pump

(CDLMNT/C54 - CHAR X(12) -- maintainer_nm):

Enter the name of the person or company who is responsible for maintenance of the pump, if known.

2.11.5.14 Rated Pump Capacity

(CDLCAP/C268 - CHAR X(5) -- capacity_va):

Enter the manufacturer's pump capacity rating in gallons per minute.

2.11.5.15 Type of Standby Power

(CDLSBY/C56 - CHAR X(1) -- standby_cd):

Enter the code indicating the type of standby power available. The codes are listed for type of power under "lift data." Use the same codes listed in section [Type of Power \(Section 2.11.5.4\)](#).

2.11.5.16 Horsepower of Standby Power

(CDLSHP/C57 - CHAR X(7)-- standby_hp_va):

Record the horsepower rating of the standby power source.

2.11.6 Repairs Record -- CDRTYP = REPR

Data elements common to all Construction Data Records for REPR Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

Source agency	Site identification number
Record type (REPR)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update
Record ready for Web	

The entry of minor site-repairs data is identified by coding “REPR” for type of construction record. The REPR components are entered as follows:

Sub-Section	Attribute Name	Description
2.11.6.1	repr_cd	Nature of repairs (C166) MANDATORY
2.11.6.2	repr_dt	Date of repairs (C167)
2.11.6.3	repr_contractor_nm	Name of contractor who made repairs (C169)
2.11.6.4	change_va	Percent change in performance after repairs (C170)

2.11.6.1 Nature of Repair

(CDRNAT/C166 - MANDATORY CHAR X(1) -- repr_cd):

Enter the code that best describes the nature of the repair work. The codes are:

Code	Description	Code	Description
B	Blocked off	O	Slotted or perforated
C	Cleaned	P	Plugged back
D	Deepened	S	Screen replaced
I	Pump intake lowered	Z	Other
L	Liner installed		

Nature of repair is a mandatory entry; repair data will not be stored without a value for this field.

2.11.6.2 Date of Repair

(CDRDAT/C167 - CHAR X(8) -- repr_dt):

Enter the date on which the repair work was completed. If the month and/or day are not known, enter blanks in the spaces. Use leading zeros for month and day less than ten, and use four digits for year.

2.11.6.3 Name of Contractor

(CDRCTR/C169 - CHAR X(12)-- repr_contractor_nm):

Enter the name of the individual or company that did the work. Use meaningful abbreviations or acronyms if needed to fit the space provided.

**2.11.6.4 Percent Performance Change
(CDRCHG/C170 - CHAR X(3) -- change_va):**

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 (-).

2.11.7 Spring Record -- CDRTYP = SPNG

Data elements common to all Construction Data Records for SPNG Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

Source agency	Site identification number
Record type (SPNG)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update
Record ready for Web	

The entry of spring data is identified by coding “SPNG” for type of construction record. Enter the SPNG components as follows:

Sub- Section	Attribute Name	Description
2.11.7.1	spng_nm	Name of spring (C172)
2.11.7.2	spng_tp	Type of spring (C173)
2.11.7.3	permanence_cd	Permanence of spring (C174)
2.11.7.4	disc_sphere_cd	Sphere of discharge (C175)
2.11.7.5	improvement_cd	Improvements (C176)
2.11.7.6	openings_nu	Number of spring openings (C177)
2.11.7.7	disc_variability_va	Flow variability (C178)
2.11.7.8	disc_variability_cd	Basis of flow variability (C179)

**2.11.7.1 Name of Spring
(CDSNAM/C172 - CHAR X(40) -- spng_nm):**

If the spring has a name by which it is known locally, enter the name here. Space is provided for up to 40 characters. If the name is longer, use meaningful abbreviations.

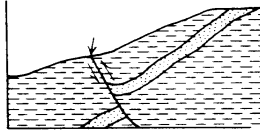
**2.11.7.2 Type of Spring
(CDSTYP/C173 - CHAR X(1) -- spng_tp):**

Enter the code indicating the type of spring. The codes and their descriptions are listed on the following page.

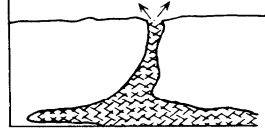
Code	Description	Code	Description
A	Artesian	K	Artesian and seepage or filtration
B	Perched and contact	L	Fracture and depression
C	Contact	P	Perched
D	Depression	O	Perched and fracture
E	Perched and depression	R	Perched and seepage or filtration
F	Fracture	S	Seepage or filtration
G	Geyser	T	Tubular - cave
H	Perched and tubular	Z	Other
J	Artesian and depression		

The figures below are sketches showing principle types of springs.

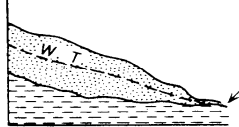
A. Artesian



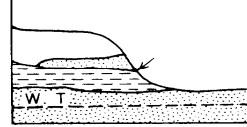
G. Geyser



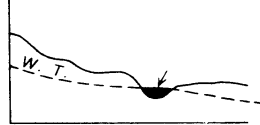
C. Contact



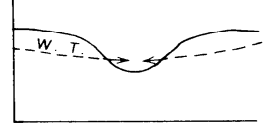
P. Perched



D. Depression



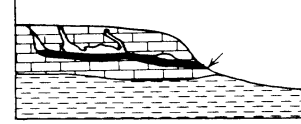
S. Seep or filtration



F. Fracture



T. Tubular



- (A) Artesian is a spring that discharges from an artesian aquifer, generally through a fault or some other geologic control. The spring flows because the head in the confined aquifer is above land surface.
- (B) Perched and contact is a spring that discharges from a perched water zone; that is a zone that is above the regional water table. The spring is located at the contact between a low permeability unit, which causes the perched water, and an overlying permeable unit.
- (C) Contact is a spring that is located at the contact between a low permeability unit, which causes the perched water, and an overlying permeable unit.
- (D) Depression is a spring that is located in a depression in the land surface that is below the regional water table.
- (E) Perched and depression is a spring that is located in a depression in a perched zone, above the regional water table.
- (F) Fracture is a spring that is located in a fissure in a consolidated-rock aquifer.

- (G) Geyser is a spring that continuously or periodically erupts, causing water to be ejected onto the land surface.
- (H) Perched and tubular is a spring that is located in a perched zone, above the regional water table, and is emerging from a tubular opening in the rock formation.
- (J) Artesian and depression is a spring that is located in a depression in an artesian aquifer.
- (K) Artesian seepage or filtration is a spring that discharges at very low rates (seeps), from an artesian aquifer. The seepage usually is visible as a wet zone on the land surface, and the discharge may be very difficult to measure.
- (L) Fracture and depression is a spring that discharges from a depression in a fractured-rock aquifer.
- (P) Perched is a spring that discharges from a zone that is above the regional water table.
- (Q) Perched and fracture is a spring that discharges from a fracture above the regional water table.
- (R) Perched and seepage or filtration is a spring that discharges, at a very low rate (seeps) from a perched zone that is above the regional water table.
- (S) Seepage or filtration is a spring similar to a depression spring except that the spring discharges at very low rates (seeps) into the depression, which is below the regional water table.
- (T) Tubular cave is a spring that discharges from a tubular-shaped opening in a cave.
- (Z) Other is any other type of spring not mentioned in this list.

2.11.7.3 Permanence

(CDSPRM/C174 - CHAR X(1) -- permanence_cd):

Enter the code indicating the permanence of the spring. The codes and their descriptions are:

Code	Description	Code	Description
P	Perennial	G	Geyser
I	Intermittent	E	Periodic - ebb and flow
R	Response to precipitation	Z	Other
S	Seasonal		

- (P) Perennial refers to springs that discharge continuously.
- (I) Intermittent refers to springs that discharge only during certain periods but at other times are dry. Although all springs may be considered to be either perennial or intermittent, more descriptive detail can be included if it is available. The following characteristics describe special types of intermittent springs that may be coded:
 - (R) Response to precipitation refers to springs that exist only after periods of rainfall.
 - (S) Seasonal refers to springs that exist only during periods of high water levels.
- (G) Geyser refers to springs that discharge at more or less regular intervals. Discharge is caused by expansive force of highly heated steam.
- (E) Periodic - ebb and flow 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.

2.11.7.4 Sphere of Discharge

(CDSSPH/C175 - CHAR X(1) -- disc_sphere_cd):

Enter the code indicating the sphere into which the spring discharges. The codes and their descriptions are:

Code	Description
A	Subaerial
W	Subaqueous

2.11.7.5 Improvements

(CDSIMP/C176 - CHAR X(1) -- improvement_cd):

Enter the code indicating the type of improvements that have been constructed at or in association with the spring. The codes and their descriptions are:

Code	Description	Code	Description
B	Boxed or small covered basin	N	No improvements
C	Concrete basin	P	Pond
G	Gallery	R	Pipe (not for conduction)
H	Spring house	L	Lined
T	Trough	Z	Other (explain in remarks)

2.11.7.6 Number of Openings

(CDSNOP/C177 - CHAR X(3) -- openings_nu):

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.

2.11.7.7 Flow Variability

(CDSVAR/C178 - CHAR X(3) -- disc_variability_va):

Where sufficient data are available to calculate or estimate the variability adequately, enter discharge variability of the spring, in percent, as expressed by the formula:

$$V = 100 \times [(a-b)/c]$$

V = Variability, in percent
a = Maximum discharge
b = Minimum discharge
c = Average discharge

2.11.7.8 Basis For Variability

(CDSACC/C179 - CHAR X(1) -- disc_variability_cd):

Enter the code indicating the basis on which the variability of the spring was determined. The codes and their descriptions are listed on the following page.

Code	Description
A	Calculated from less than 1 year of continuous discharge record
B	Calculated from 1 to 5 years of continuous discharge record
C	Calculated from more than 5 years of continuous discharge record
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)

2.11.8 Measuring-Point Record -- CDR TYP = MPNT

Data elements common to all Construction Data Records for MPNT Record Type are entered following the instructions in sections 2.1 through 2.10. Here is a brief review for your convenience:

Source agency	Site identification number
Record type (MPNT)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update)
Record ready for Web	

The entry of measuring-point data is identified by coding “MPNT” for type of construction record. Enter the MPNT components as shown below:

Sub-Section	Attribute Name	Description
2.11.8.1	mpnt_begin_dt	Begin date for use of this measuring point (C321)
2.11.8.2	mpnt_end_dt	End date for use of this measuring point (C322)
2.11.8.3	mpnt_height_va	Height of this measuring point (C323)
2.11.8.4	mpnt_alt_va	Measuring point altitude (C325)
2.11.8.5	mpnt_alt_meth_cd	Method altitude determined (326)
2.11.8.6	mpnt_alt_acy_va	Measuring point altitude accuracy (C327)
2.11.8.7	mpnt_alt_datum_cd	Measuring point altitude datum (C328)
2.11.8.8	mpnt_ds	Description of this measuring point (C324)

2.11.8.1 Beginning Date

(CDMPBD/C321 - CHAR X(8) -- mpnt_begin_dt):

Enter the date on which the measuring point was established. If the day and/or month are unknown, enter them as blanks. Use leading zeros for values of month and day that are less than ten, and specify all four digits for the year. **Note: Date is a control field; therefore, two entries with the same date will not be accepted.**

2.11.8.2 Ending Date

(CDMPED/C322 - CHAR X(8)-- mpnt_end_dt):

If this measuring point is no longer used, enter the date on which it was last used as a measuring point. A new occurrence of the measuring point data should be used for the

new measuring point. In this way, a history of measuring point data corresponding to each water level can be maintained.

**2.11.8.3 Height of Measuring Point
(CDMPHT/C323 - CHAR X(6) -- mpnt_height_va):**

For observation wells or other wells where repeated measurements are made, enter the height of the measuring point, in feet, above or below land surface datum. Values for measuring points below land surface should be preceded by a minus sign (-).

**2.11.8.4 Measuring Point Altitude
(CDMPAL/C325 - CHAR X(8) -- mpnt_alt_va):**

Enter the altitude of the measuring point, in feet above a specific Vertical Datum. An entry of Altitude also requires the entry of C326 (Method Altitude Determined), C327 (Measuring Point Altitude Accuracy), and C328 (Measuring Point Altitude Datum).

**2.11.8.5 Method Altitude Determined
(CDMPME/C326 - CHAR X(1) -- mpnt_alt_meth_cd):**

Enter the code of the method used to determine the altitude of the measuring point. When Measuring Point Altitude is entered, the code is *mandatory*. The codes are listed below.

Code	Description
A	Altimeter
D	Differential Global Positioning System (GPS)
G	Global Positioning System
L	Level or other surveying method
M	Interpolated from topographic map
N	Interpolated from digital elevation model (DEM)
R	Reported
U	Unknown

**2.11.8.6 Measuring Point Altitude Accuracy
(CDMPAC/C327 - CHAR X(3) -- mpnt_alt_acy_va):**

Enter the altitude accuracy of the measuring point in terms of the possible error in feet. An accuracy of +/- 0.1 foot would be entered as ".1". Many altitudes are interpolated from the contours on topographic maps; accuracies determined in this way are generally entered as one-half of the contour interval.

2.11.8.7 Measuring Point Altitude Datum
(CDMPDC/C328 - CHAR X(10) -- mpnt_alt_datum_cd

Enter the altitude datum of the measuring point. The datums are listed in the following table.

Datum	Description
NGVD29	National Geodetic Vertical Datum of 1929
NAVD88	North American Vertical Datum of 1988
OLDAK	Old Alaska (Mainland) and Aleutian Island Datum
OLDPR	Old Puerto Rico and Virgin Island Datum
HILOCAL	Local Hawaiian Datum
ASLOCAL	Local American Samoa Datum
GULOCAL	Local Guam Datum
COE1912	COE Datum 1912

If new datums need to be added to this reference list, please refer to [Database Administrators Manual, section 7.3.1](#). **Note: No conversions to alternate datums will be provided for the new datums.**

2.11.8.8 Measuring Point Description
(CDMPRM/C324 - CHAR X(94) mpnt_ds):

A detailed description of the measuring point may be entered here. Up to 94 characters of remarks are allowed.

Section 3. Water-Level Record Components

The WATER LEVEL record is used to store water-level data for lake, stream, spring, ground-water, subsurface, land, facilities, wetland, and estuary sites. For the water-level file the primary key is a combination of Source Agency Code (C4), Site Identification (Site ID) Number (C1), Measurement Date (C235), and Measurement Time (C709). Of these, Source Agency Code, Site ID, and Measurement Date are mandatory. The data table name for water-level data is GW_LEV_##.

Sub-Section	Attribute Name	Description
3.1	agency_cd	Source agency code (C4) MANDATORY
3.2	site_no	Site identification number (C1) MANDATORY
3.3	lev_dt	Measurement date (C235) MANDATORY
3.4	lev_tm	Measurement time (C709)
3.5	lev_cn	Person creating record (C427)
3.6	lev_cr	Date and time created (C428)
3.7	lev_mn	Person updating record (C429)
3.8	lev_md	Date and time of last update (C710)
3.9	lev_web_cd	Record ready for Web (C858)
3.10	lev_ent_cd	Water-level Type Code (C243) MANDATORY
3.11	lev_va	Water level referenced to Land Surface Datum CONDITIONALLY MANDATORY (C237)
3.12	mp_lev_va	Water level referenced to Measuring Point CONDITIONALLY MANDATORY (C241)
3.13	sl_lev_va	Water level referenced to Vertical Datum CONDITIONALLY MANDATORY (C242)
3.14	lev_status_cd	Site Status for water level (C238)
3.15	lev_meth_cd	Method of measurement (C239) MANDATORY
3.16	lev_statistics_cd	Water-level Reference (C240)
3.17	lev_acy_cd	Water-level accuracy (C276) CONDITIONALLY MANDATORY
3.18	lev_src_cd	Water-level source (C244) MANDATORY
3.19	date_acy_cd	Date accuracy (C236)
3.20	sl_datum_cd	Water-level datum (C245) CONDITIONALLY MANDATORY
3.21	lev_party_tx	Water-level party (C246)
3.22	lev_agency_cd	Measuring Agency (C247) MANDATORY
3.23	lev_mpnt_seq_nu	Sequence Number of MP Record (C248) CONDITIONALLY MANDATORY
3.24	equip_id_tx	Equipment Identifier (C249)
3.25	Lev_rmk_tx	Remarks (C267)

3.1 Source Agency Code

(WLAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) --agency_cd):

This is the agency that is the source of the site data. The Source Agency Code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. For a detailed description see [Section 1.1](#).

3.2 Site Identification Number

(WLID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

This is the 8 to 15-digit site identification (Site ID) number of the site to which the water-level data apply. If the site has not been entered into the Sitefile, this operation must be completed before the water-level data are input. The Site Identification Number is mandatory and a part of the primary key. For a detailed description see [Section 1.2](#).

3.3 Measurement Date

(WLDATE/C235 - PK1 - MANDATORY PRIMARY-KEY CHAR X(8) -- lev_dt):

Enter the date on which the water level was measured. If the day and/or month are not known, enter blanks in the spaces. Use leading zeros for values of month and day less than ten, and specify all four digits for year. **Note: Source Agency Code, Site Identification Number, and Measurement Date are part of the primary key. Therefore, two entries with the same date and time will not be accepted. Furthermore, if the date is known to the year only, one entry only for that year may be specified.**

3.4 Measurement Time

(WLTIME/C709 - PRIMARY-KEY CHAR X(4) -- lev_tm):

Enter the time of day, when known, using the 24-hour clock. Enter 0000 for midnight. When entered, the time becomes part of the primary key.

3.5 Person Creating Record

(WLCUID/C427 - CHAR X(8) -- lev_cn):

This field contains the user identification of the person creating the record. The user ID is entered automatically by the NWIS software.

3.6 Date and Time Created

((WLCRDT/C428 - CHAR X(14) -- lev_cr):

This field contains the date and time that the record was created. The date and time are entered automatically by the NWIS software. **Note: Before Release 3_1 of the NWIS software, only the date was recorded. Any water-level record created before NWIS release 3_1 has been populated with a time of 0000.**

3.7 Person Updating Record (WLUUID/C429 - CHAR X(8) -- lev_mn):

This field contains the name of the person updating the record. The user ID is entered automatically by the NWIS software.

3.8 Date and Time of Last Update (WLUPDT/C710 - CHAR X(14) -- lev_md):

This contains the date and time the record was last updated. The date and time are entered automatically by the NWIS software. *Note: Before Release 3_1 of the NWIS software, only the date was recorded. Any water-level record updated before NWIS Release 3_1 has been populated with a time of 0000.*

3.9 Record Ready for Web (WLWBF/C858 -SK2 - MANDATORY - CHAR X(1) -- lev_web_cd):

This mandatory field contains the status and availability of a record for display on the World-Wide-Web. ‘Y’ is the default. Only records flagged with a ‘Y’ are made available on the Web. Records flagged with any other valid code will not be available on the Web. In order to change the flag, the record has to be updated manually to the new code. GWCheck does not change the Web Ready flag for this field. The codes and their meanings are:

Code	Description
Y	Record has been checked and is ready for Web display.
C	Record has not been checked. No Web display.
P	Record is proprietary. No Web display.
L	Local use only. No Web display.

3.10 Water-Level Entry Code (WLVENT/C243 - MANDATORY CHAR X(1) -- lev_ent_cd)

Water levels are referenced to land surface datum (LSD), measuring point (MP), or a specific vertical datum. Only one water-level type may be entered for any date and time. This field is mandatory. Enter the datum to which the water level will be referenced:

Code	Description
L	Water Level referenced to Land Surface Datum (LSD)
M	Water Level referenced to Measuring Point (MP)
S	Water Level referenced to Vertical Datum

3.11 Water Level Referenced to Land Surface Datum (LSD) **(WLEVL/C237 – CONDITIONALLY MANDATORY CHAR X(7) -- lev_va:**

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, the value should be preceded with a minus sign (-). If the site is being pumped, and a head or water level can be determined, record a site status code of P and enter the head or water level. When a water level referenced to land surface cannot be measured because the site is flowing or pumping and the head is not known, the site is dry, the site is affected by ice, there is an obstruction, the measurement has been discontinued, or the well was destroyed, leave the water-level field blank and record the appropriate site status for water level code. Water level below land surface is conditionally mandatory dependent on the site status entered for the water level. For a more detailed description see [section 3.14](#).

Note : *Altitude (C16) must be entered in the SITEFILE before any water level can be referenced to LSD.*

3.12 Water Level Referenced to Measuring Point **(WLEVMP/C241 – CONDITIONALLY MANDATORY CHAR X(8) -- mp_lev_va):**

Enter the water level at the site referenced to the measuring point, in feet below measuring point. If the water level is above measuring point, the value should be preceded with a minus sign (-). If the site is being pumped, and a head or water level can be determined, record a site status code of P and enter the head or water level. When a water level referenced to a measuring point cannot be measured because the site is flowing or pumping and the head is not known, the site is dry, the site is affected by ice, there is an obstruction, the measurement has been discontinued, or the well was destroyed, leave the water-level field blank and record the appropriate site status for water level code. Water level referenced to the measuring point is conditionally mandatory dependent on the site status entered for the water level. For a more detailed description see [section 3.14](#).

Note: *An entry of Water Level below Measuring Point requires the entry of Measuring Point Sequence number (C248). Measuring Point Altitude (C325) or combination station altitude (C16) and MP height (C323) MUST be entered into the database before any entry of water level below MP (C241) can be made.*

3.13 Water Level Referenced to Vertical Datum

(WLEVSL/C242 – CONDITIONALLY MANDATORY CHAR X(8) -- (sl_lev_va)):

Enter the water level at the site referenced to the specific vertical datum, in feet above the specific vertical datum. Precision can be carried to two decimal places. If the water level is below the referenced vertical datum, the value should be preceded with a minus sign (-). If the site is being pumped, and a head or water level can be determined, record a site status code of P and enter the head or water level. When a water level referenced to a vertical datum cannot be measured because the site is flowing or pumping and the head is not known, the site is dry, the site is affected by ice, there is an obstruction, the measurement has been discontinued, or the well was destroyed, leave the water-level field blank and record the appropriate site status for water level code. **Water Level Referenced to Vertical Datum** is conditionally mandatory dependent on the site status entered for the water level. For a more detailed description see [section 3.14](#).

Note: An entry of Water level referenced to Vertical Datum also requires the entry of C245 (Water-Level Datum).

3.14 Site Status for Water Level

(WLSTAT/C238 - CHAR X(1) -- lev_status_cd):

Enter the code indicating the status of the site at the time the water level was measured. If the water level represents a static level, leave this field blank. The codes and their descriptions are:

Code	Description
A	Water level was affected by atmospheric pressure.
B	Water level was affected by tide stage.
C	Water level was frozen (no water level was recorded).
D	Site was dry (no water level was recorded).
E	Site was flowing recently.
F	Site was flowing. Water level or head could not be measured without additional equipment.
G	Nearby site that taps the same aquifer was flowing.
H	Nearby site that taps the same aquifer had been flowing recently.
I	Recharge water was being injected into the aquifer at this site (Injector site).
J	Recharge water was being injected into nearby site that taps the same aquifer (Injector site monitor).
M	Well was not in hydraulic contact with formation (water was from a source other than that defined in C714 or C93).
N	Measurement was discontinued (no water level was recorded).
O	Complete obstruction was encountered in the well (no water level was recorded).
P	Water level was affected by pumping at the time of the measurement.
R	Water level was affected by recent pumping.
S	Water level was affected at the time of the measurement by pumping at a nearby site that taps the same aquifer.
T	Water level was affected recently by pumping at a nearby site that taps the same aquifer.

Code	Description
V	Foreign substance was present on the surface of the water.
W	Well was destroyed (no subsequent water levels should be recorded).
X	Water level was affected by stage in nearby surface-water site.
Z	Other conditions existed that would have affected the measured water level. Explain in the Remarks Record (RMKS) record <u>C185</u> (section 3.25).

- If no site status is indicated, the reported water-level measurement represents a static level.
- Water Levels (C237, C241, C242) cannot be entered with status codes of C, D, F, N, O, or W; one or the other must be left blank.
- Water Levels (C237, C241, C242) are allowed with status code P, and no warning will be returned. Water levels are required with status codes A, B, E, G, H, I, J, M, R, S, T, V, X, and Z.
- Statistics generated during some tabling options will not include water levels where a status code is indicated.

Note: Because of the relations between conditionally mandatory fields, it is not possible to modify certain values concurrently in an existing water-level record. For example, if a site has a water level of 0.0 and no value in the site status field, it is not possible to delete the water level and add a status of Dry in the same session. Instead, you must delete the entire record and re-enter it correctly.

3.15 Water-Level Method of Measurement

(WLMETH/C239 – MANDATORY CHAR X(1) -- lev_meth_cd):

Enter the code indicating how the water level was measured. This field is mandatory. The codes and their descriptions are:

Code	Description
A	Airline
B	Analog or graphic recorder
C	Calibrated airline
D	Differential Global Positioning System. This code is especially applicable to surface expressions of ground water.
E	Estimated
F	Transducer
G	Pressure-gage
H	Calibrated pressure-gage
L	Interpreted from geophysical logs
M	Manometer
N	Non-recording gage
O	Observed (required for use with WL_STATUS codes F, N, and W and allowed for all other WL_STATUS codes)
P	Acoustic pulse
R	Reported, method not known
S	Steel-tape
T	Electric-tape

Code	Description
U	Unknown (for transfer of legacy data only, not for entry of new data)
V	Calibrated electric tape – accuracy of instrument has been checked
Z	Other (explain in remarks, field C185)

3.16 Water-Level Reference Code

(WLREF/C240 - CHAR X(1) -- lev_statistics_cd):

If the water level was obtained from a continuous recorder (analog or digital), enter the code that indicates how the value was selected from the readings available for that day. The possible codes and their descriptions are:

Code	Description
M	Water level shown is a daily maximum (i.e., deepest water level for the day).
N	Water level shown is a daily minimum (i.e., shallowest water level for the day).
X	Water level shown is the daily mean.
A	Water level is 12:00 noon reading.
P	Water level is 12:00 midnight reading.
Z	Water level shown is the monthly mean.

3.17 Water-Level Accuracy

(WLACC/C276 – CONDITIONALLY MANDATORY CHAR X(1) --lev_acy_cd):

Use the following codes to qualify the accuracy of the water-level data. Accuracy will be calculated from the entered value for new water levels and automatically populated; this value may be over-ridden by manual entry of a water-level accuracy code from the following list of codes. This field is mandatory if a water level has been entered:

Code	Description
0	Water level accurate to nearest foot
1	Water level accurate to nearest tenth of a foot
2	Water level accurate to nearest one-hundredth of a foot
9	Water level accuracy not to nearest foot

Starting in NWIS 4.4, a new rounding routine was implemented for water levels being sent to the Web (C858='Y'). Water levels will be rounded according to C276 as they are sent to the Web and will be displayed on the Web as the value calculated during the rounding.

Note: A code of 9 indicates uncertainty of greater than 1 foot but it does not imply any accuracy (for example to the nearest 5, 10, or 100 feet). Because there is no set accuracy associated with this code, water levels with this accuracy code are rounded to the nearest foot.

3.18 Water-Level Source

(WLVSRC/C244 – MANDATORY CHAR X(1) -- lev_src_cd):

Enter the code that best indicates source of the water-level data. The codes are the same as those used for Source of Depth Data (SWDSRC). Entry of this component is mandatory with water-level measurement. The codes and their descriptions are:

Code	Description
A	Reported by another government agency. Do not use A if the reporting agency is the owner of the well--use O .
D	From driller's log or report.
G	Private geologist-consultant or university associate.
L	Depth interpreted from geophysical logs by personnel of source agency.
M	Memory (owner, operator, driller): less reliable than D – reported by owner.
O	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.
U	Unknown (for transfer of legacy data only, not for entry of new data)
Z	Other source (explain in the general remarks (RMKS) record C185.).

3.19 Water-Level Date Accuracy

(WLDACC/C236 - CHAR X(1) -- date_acy_cd):

This field is populated automatically based on the contents of WLDATE (C235). The following codes indicate the accuracy of the entered water-level date:

Code	Description
D	Date to nearest day
M	Date to nearest month
Y	Date to nearest year

3.20 Water-Level Datum

(WLVDTM/C245 - CONDITIONALLY MANDATORY CHAR X(10)--sl_datum_cd):

If the water level is referenced to a vertical datum, component C242, entry of the vertical datum for the altitude of the water surface is mandatory. For a complete current list of valid codes see: /usr/opt/nwis/support/edit.tables/saltdm.edi.

The only vertical datums that can be converted on output are NGVD29 (National Geodetic Vertical Datum of 1929) and NAVD88 (North American Vertical Datum of 1988). NWIS uses the North American Vertical Datum Conversions (VERTCON) of the

National Geodetic Survey to convert from NGVD29 to NAVD88 or vice-versa. Conversions to or from other vertical datums are not available.

If new datums need to be added to this reference list, please refer to [Database Administrator's Manual, Section 7.3.1](#).

3.21 Water-Level Party

(WLPRTY/C246 - CHAR X(6) -- lev_party_tx):

Enter the name or initials of the person measuring the water level.

3.22 Measuring Agency (Source)

(WLSAGY/C247 – CONDITIONALLY MANDATORY CHAR X(5) – lev_agency_cd):

Enter the agency code of the person measuring the water level. Entry must be a valid code name in the agency_cd reference list. Entry of the measuring agency is mandatory. Agency code must be a valid code from the agency_cd (C4) reference list. This field is required only if water-level source is A (reported by another government agency) or S (measured by personnel or reporting agency).

3.23 Sequence Number of Measuring Point (MP) Record

(WLMP SQ/C248 – CHAR X(3) - lev_mpnt_seq_nu

If the water level is referenced to a measuring point (C241), entry of the MP Sequence Number (248) is mandatory. Enter the sequence number of the MP Record in use at the time the water level referenced to the measuring point was recorded. This defaults to “001” and must be changed if it is incorrect.

3.24 Equipment Identifier

(WLEQID/C249 – VARCHAR X(20) – equip_id_tx

Enter an identifier for the water-level meter or other equipment used to obtain the measurement.

3.25 Remarks

(WLRMK/C267 – VARCHAR X(256) – lev_rmk_tx

Enter any comments or remarks pertaining to the measurement of the water level or any part of this water-level record. NOTE: Because of the 256 character field length, the only ways to view these remarks in full are (a) on screen using the Screen Entry program; and (b) in a Subfile table using RDB format. Be aware when using the Subfile RDB format, the limit per record is 1,000 characters, so the total field length of all the components requested for tabling should not exceed 1,000 characters. A standard retrieval cannot display this field. A dump retrieval truncates this field.

Section 4. Discharge Record Components

The DISCHARGE or WITHDRAWAL record is used to store water-level and discharge data needed to estimate well performance for both flowing and pumped sites. All site types except atmosphere (AT), stream (ST), and aggregate water use (AW, AS, AG) may have data in the DISCHARGE table. The table name for discharge data is GW_DISC_##. The DISCHARGE record is coded as follows:

Sub-Section	Attribute Name	Description
4.1	agency_cd	Source agency code (C4) MANDATORY
4.2	site_no	Site identification number (C1) MANDATORY
4.3	disc_seq_nu	Record sequence number(C147) MANDATORY
4.4	disc_dt	Date discharge measured (C148) MANDATORY
4.5	disc_cn	Person creating record (C430)
4.6	disc_cr	Date and time created (C431)
4.7	disc_mn	Person updating record (C432)
4.8	disc_md	Date and time of last update (C702)
4.9	disc_web_cd	Record ready for Web (C859)
4.10	disc_tp	Type of discharge -- pump or flow (C703) MANDATORY
4.11	disc_va	Discharge, in gpm (C150) MANDATORY
4.12	disc_acy_cd	Accuracy of discharge measurement (C310)
4.13	disc_src_cd	Source of discharge data (C151)
4.14	disc_meth_cd	Method discharge measured (C152) MANDATORY
4.15	disc_prod_lev_va	Producing water level (C153)
4.16	disc_static_lev_va	Static water level (C154)
4.17	disc_lev_src_cd	Source of water-levels data (C155)
4.18	disc_lev_meth_cd	Method water levels measured (C156)
4.19	disc_du	Duration of discharge before producing level (C157)
4.20	spec_cap_va	Specific capacity (C272)
4.21	drawdown_va	Drawdown (C309)

4.1 Source Agency Code

(DIAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

This is the agency that is the source of the site data. The Source Agency Code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. For a detailed description see [Section 1.1](#).

4.2 Site Identification Number

(DIID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

This is the 2 to15-digit site identification (Site ID) number of the site to which the discharge data applies. If the site has not been entered into the Sitefile, this operation must be completed before the discharge data are input. Site ID is mandatory and a part of the primary key. Data for the site will not be stored if this field is blank. For a detailed description see [Section 1.2](#).

4.3 Record Sequence Number

(DISEQ/C147 - MANDATORY PRIMARY-KEY CHAR X(3) -- disc_seq_nu):

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; production data will not be stored if the field is blank.

4.4 Date Discharge Measured

(DIDTE/C148 - SK3 - MANDATORY PRIMARY-KEY CHAR X(8) -- disc_dt):

Enter the date on which the discharge data were determined. If the day and/or month are not known, enter blanks in the spaces. Use leading zeros for values of month or day less than ten, and specify all four digits of the year. This field is mandatory.

4.5 Person Creating Record

(DICUID/C430 - CHAR X(8) -- disc_cn):

This contains the user identification of the person creating the record. The user ID is entered automatically by the NWIS software.

4.6 Date and Time Created

(DICRDT/C431 - CHAR X(14) -- disc_cr):

This contains the date and time the record was created. The date and time are entered automatically by the NWIS software.

4.7 Person Updating Record

(DIUUID/C432 - CHAR X(8) -- disc_mn):

This contains the user identification of the person who last updated the record. The user ID is entered automatically by the NWIS software.

4.8 Date and Time of Last Update

(DIUPDT/C702 - CHAR X(14) --disc_md):

This contains the date and time the record was last updated. The date and time are entered automatically by the NWIS software.

4.9 Record Ready for Web

(DIWBFG/C859 - CHAR X(1) -- disc_web_cd):

This field contains the status and availability of a record for display on the World-Wide-Web. 'Y' is the default. Only records flagged with a 'Y' are made available on the Web. The codes and their descriptions are:

Code	Description
Y	Yes-Record has been checked and is ready for Web display.
C	Conditional-Record has not been checked. No Web display.
P	Proprietary Record. No Web display.
L	Local use only. No Web display.

4.10 Type of Discharge

(DITYPE/C703 - MANDATORY SECONDARY-KEY CHAR X(1) -- disc_tp):

Enter the code for type of discharge recorded in the record. This field is mandatory.

Code	Description
P	Pumped discharge
F	Flow discharge

4.11 Discharge

(DIVAL/C150 - MANDATORY SECONDARY-KEY CHAR X(10) -- disc_va):

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; production data will not be stored if this field is blank.

4.12 Accuracy of Discharge Measurement

(DIACY/C310 – CHAR X(1) – disc_acy_cd):

Enter the estimated accuracy of the discharge measurement.

Code	Description
E	Excellent (less than 2%)
G	Good (2% - 5%)
F	Fair (5% - 8%)
P	Poor (greater than 8%)

4.13 Source of Data

(DISRC/C151 - CHAR X(1) -- disc_src_cd):

Enter the code that indicates who furnished the data. The codes are the same as those for source-of-depth data (SWDSRC-C29) (see [Source of Depth Data – Section 1.53](#) under Sitefile Components).

4.14 Method of Discharge Measurement

(DIMET/C152 - MANDATORY CHAR X(1) -- disc_meth_cd):

Enter the code that best describes the method used to determine the discharge. This field is mandatory. The codes are:

Code	Description
A	Acoustic meter (transient-time meter)
B	Discharge measured with a bailer
C	Current meter--either propeller-type meter in the discharge pipe, or propeller- or cup-type meter in the discharge channel.
D	Doppler meter
E	Estimated
F	Flume measurement
M	Totaling meter
O	Orifice measurement
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 measurement
V	Volumetric measurement: bucket or barrel and stopwatch
W	Weir measurement
X	Unknown
Z	Other

4.15 Production Level

(DIPROD/C153 - CHAR X(8) -- disc_prod_lev_va):

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 measurable) is the head above land surface preceded by a minus sign (-). Production level values are limited to a maximum of 2 decimal places.

4.16 Static Level

(DISTAT/C154 - CHAR X(8) -- disc_static_lev_va):

Enter the static water level, in feet below land surface. If the static level is above land surface, enter the head above land surface (if measurable) preceded by a minus sign (-).

4.17 Source of Data

(DILVSC/C155 - CHAR X(1) -- disc_lev_src_cd):

Enter the code indicating who provided the water-level data. The codes are the same as those used for source-of-depth data (SWDSRC/C29). (see [Source of Depth Data – Section 1.53](#)).

4.18 Method of Water-Level Measurement

(DILVME/C156 - CHAR X(1) -- disc_lev_meth_cd):

Enter the code indicating the method by which the water levels were determined. If the static level and the production level were measured by different methods, record the method considered least accurate.

Code	Description
A	Airline measurement
B	Analog or graphic recorder
C	Calibrated airline measurement
D	Differential GPS
E	Estimated
F	Transducer
G	Pressure-gage measurement
H	Calibrated pressure-gage measurement
L	Interpreted from geophysical logs
M	Manometer measurement
N	Non-recording gage
O	Observed
R	Reported, method not known
S	Steel-tape measurement
T	Electric-tape measurement
V	Calibrated electric-tape measurement
Z	Other

4.19 Pumping Period

(DIDUR/C157 - CHAR X(7) -- disc_du):

Enter the length of time, in hours, that the well was pumped prior to the measurement of production level. One decimal place is provided for times shorter than one hour.

4.20 Specific Capacity

(DISPCP/C272 - CHAR X(8) -- spec_cap_va):

The specific capacity of a well is the rate of discharge of water from the well divided by the drawdown of water level within the well (Lohman and others, 1972, p. 11).

If production 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 drawdown (gal/min)/ft. Specific capacity will be automatically computed and stored if discharge and drawdown are known.

4.21 Drawdown

(DIDRON/C309 - CHAR X(8) -- drawdown_va):

The drawdown, in feet, observed in a pumping well is the difference between the static water level and the production water level. Drawdown will be automatically computed and stored if production and static levels are known.

Section 5. Miscellaneous Record Components

Sub-Section	Description
5.1	Source agency code (C4) MANDATORY
5.2	Site identification number (C1)MANDATORY
5.3	Record type (see below) MANDATORY
5.4	Record sequence number MANDATORY
5.5	Person creating record
5.6	Date and time created
5.7	Person updating record
5.8	Date and time of last update
5.9	Record ready for Web
5.10	Remainder of record (depend on record type)

The MISCELLANEOUS record is used to store components that do not relate to a specific category. Thirteen types of these data are included, each identified by a component record type (MGDTYP). The following is a list of the component codes used in the MISCELLANEOUS data file.

Record Type	Description of Contents	Data Table Name
OWNER	Includes owner name data	site_owner_##
OCNT	Includes owner contact data	site_contact_##
OTID	Includes other-identifier data	gw_otid_##
OTDT	Includes other-data-available data	gw_otdt_##
VIST	Includes site-visits data	gw_vist_##
LOGS	Includes geophysical logs data	gw_logs_##
NETW	Includes networks data	gw_netw_##
SPEC	Includes special-cases data	gw_spec_##
MSVL	Includes miscellaneous-values data	gw_msvl_##
COOP	Includes cooperators data	gw_coop_##
RMKS	Includes remarks data	gw_rmks_##

The primary keys are defined as source agency, site identification number, record type, and record sequence number or water-quality record number for QUAL and QVAL; all of these entries are mandatory. Enter the first characters of the record as follows:

5.1 Source Agency Code

(MGAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

This is the agency that is the source of the site data. The Source Agency Code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. For a detailed description see [Section 1.1](#).

5.2 Site Identification Number

(MGDID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

This is the 2 to 15-digit site identification (Site ID) number of the site to which the water-level data apply. If the site has not been entered into the Sitefile, this operation must be

completed before the miscellaneous data are input. The Site Identification Number is mandatory and a part of the primary key. For a detailed description see [Section 1.2](#).

5.3 Record Type (MGDTYP - MANDATORY SECONDARY-KEY CHAR):

The RECORD TYPE identifies the category of data included in the record. There are 13 categories with the MISCELLANEOUS data. This field is mandatory and is a secondary key. The categories are as follows:

Record Type	Description	Types of sites allowed (see section 1.9)
OWNR	Owner record (C768)	All
OCNT	Owner Contact (C797)	All
OTID	Other-identifiers record (C770)	All
OTDT	Other-data-available record (C772)	All
VIST	Site-visits record (C774)	All but AG, AS, AW
QUAL	Field qw record entry record (C776)	All
QVAL	Field qw values record (C791)	All
LOGS	Geophysical logs record (C778)	GL, OC, LK, GW, SB, LA, WE, ES, FA-SPS, FA-WIW
NETW	Networks record (C780)	All
SPEC	Special-cases record (C782)	GW, SB, LA, FA- (all)
MSVL	Miscellaneous-values record (C784)	All
COOP	Cooperator data record (C786)	All
RMKS	Remarks record (C788)	All

5.4 Record Sequence Number (MGDSEQ - MANDATORY PRIMARY-KEY CHAR X(3)):

This is the number assigned at time of data entry to keep data by category in logical order. Water-quality records (QUAL and QVAL) use QWDATA record number in place of a sequence number; rules for establishing this number will be explained in the sections describing QUAL and QVAL data entry. This number is mandatory and a part of the primary key. The component number for the record sequence number depends on the record type as follows:

Record Type	Description	Attribute Name
OWNR	Owner record (C718)	site_owner_nu
OCNT	Owner contact (C798)	site_contact_nu
OTID	Other-identifiers record (C736)	otid_seq_nu
OTDT	Other-data-available record (C312)	otdt_seq_nu
VIST	Site-visits record (C737)	vist_seq_nu
QUAL	Field qw record entry record (C738)	record_no
QVAL	Field qw values record (C792)	record_no
LOGS	Geophysical logs record (C739)	logs_seq_nu
NETW	Networks record (C730)	netw_seq_nu
SPEC	Special-cases record (C729)	spec_seq_nu
MSVL	Miscellaneous-values record (C313)	mssl_seq_nu
COOP	Cooperator data record (C734)	coop_seq_nu
RMKS	Remarks record (C311)	rmks_seq_nu

5.5 Person Creating Record (MGDCUI - CHAR X(8) in positions 28-35):

This contains the user identification of the person creating the record. Entry of the user ID is made by the NWIS software automatically. The component number for the person creating the record depends on the record type as follows:

Record Type	Description	Attribute Name
OWNR	Owner record (C433)	site_owner_cn
OCNT	Owner contact record (C877)	site_contact_cn
OTID	Other-identifiers record (C436)	otid_cn
OTDT	Other-data-available record (C439)	otdt_cn
VIST	Site-visits record (C442)	vist_cn
QUAL	Field qw record entry record (C445)	sample_cn
QVAL	Field qw values record (C793)	result_cn
LOGS	Geophysical logs record (C448)	logs_cn
NETW	Networks record (C451)	netw_cn
SPEC	Special-cases record (C454)	soec_cn
MSVL	Miscellaneous-values record (C457)	msvl_cn
COOP	Cooperator data record (C460)	coop_cn
RMKS	Remarks record (C463)	rmks_cn

5.6 Date and Time Created (MGDCRD - CHAR X(14) in positions 36-49):

This contains the date and time the record was created. The date and time are entered automatically by the NWIS software. The component number for the date the record was created depends on the record type as follows:

Record Type	Description	Attribute Name
OWNR	Owner record (C434)	site_owner_cr
OCNT	Owner contact record (C878)	site_contact_cr
OTID	Other-identifiers record (C437)	otid_cr
OTDT	Other-data-available record (C440)	otdt_cr
VIST	Site-visits record (C443)	vist_cr
QUAL	Field qw record entry record (C446)	sample_cr
QVAL	Field qw values record (C794)	result_cr
LOGS	Geophysical logs record (C449)	logs_cr
NETW	Networks record (C452)	netw_cr
SPEC	Special-cases record (C455)	spec_cr
MSVL	Miscellaneous-values record (C458)	msvl_cr
COOP	Cooperator data record (C461)	coop_cr
RMKS	Remarks record (C464)	rmks_cr

5.7 Person Updating Record (MGDUUI - CHAR X(8) in positions 50-57):

This contains the user identification of the person updating the record. The user ID is entered automatically by the NWIS software. The component number for the user identification of the person creating the record depends on the record type as follows:

Record Type	Description	Attribute Name
OWNR	Owner record (C435)	site_owner_mn
OCNT	Owner contact record (C879)	site_contact_mn
OTID	Other-identifiers record (C438)	otid_mn
OTDT	Other-data-available record (C441)	otdt_mn
VIST	Site-visits record (C444)	vist_mn
QUAL	Field water-quality record (C447)	qual_mn
LOGS	Geophysical logs record (C450)	logs_mn
NETW	Networks record (C453)	netw_mn
SPEC	Special-cases record (C456)	spec_mn
MSVL	Miscellaneous-values record (C459)	msvl_mn
COOP	Cooperator data record (C462)	coop_mn
RMKS	Remarks record (C465)	rmks_mn

5.8 Date and Time of Last Update (MGDUPD/C769 - CHAR X(14) in positions 58-71):

This contains the date and time that the record was last updated. The date and time are entered automatically by the NWIS software. The component number for the date of last update depends on the record type as follows:

Record Type	Description	Attribute Name
OWNR	Owner record (C769)	site_owner_md
OCNT	Owner contact record (C880)	site_contact_md
OTID	Other-identifiers record (C771)	otid_md
OTDT	Other-data-available record (C773)	otdt_md
VIST	Site-visits record (C775)	vist_md
QUAL	Field water-quality record (C777)	qual_md
LOGS	Geophysical logs record (C779)	logs_md
NETW	Networks record (C781)	netw_md
SPEC	Special-cases record (C783)	spec_md
MSVL	Miscellaneous-values record (C785)	msvl_md
COOP	Cooperator data record (C787)	coop_md
RMKS	Remarks record (C789)	rmks_md

5.9 Record Ready for Web (MGDWFG - CHAR X(1) in position 72):

This field contains the status and availability of a record for display on the World-Wide-Web. 'Y' is the default. Only records flagged with a 'Y' are made available on the Web. The codes and their descriptions are listed below.

Code	Description
Y	Yes - Record has been checked and is ready for Web display.
C	Conditional - Record has not been checked. No Web display.
P	Proprietary Record. No Web display.
L	Local use only. No Web display.

Record Type	Description	Attribute Name
OTID	Other-identifiers record (C861)	otid_web_cd
OTDT	Other-data-available record (C862)	otdt_web_cd
VIST	Site-visits record (C863)	vist_web_cd
QUAL	Field water-quality record (C864)	qual_web_cd
LOGS	Geophysical logs record (C865)	logs_web_cd
NETW	Networks record (C866)	netw_web_cd
SPEC	Special-cases record (C867)	spec_web_cd
MSVL	Miscellaneous-values record (C868)	msvl_web_cd
COOP	Cooperator data record (C869)	coop_web_cd
RMKS	Remarks record (C870)	rmks_web_cd

5.10 Data Dependent On Record Type (MGDATA - CHAR X(55)):

These fields are described below for each record type.

5.10.1 Owner Record -- MGDTYP = OWNR

Data elements common to all Miscellaneous Data Records of the owner's data record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

Source agency code	Site identification number
Record type (OWNR)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update
Record-ready-for-Web	

In order for NWIS to store OWNR records, one of the address fields ([5.10.1.8](#) - [5.10.1.13](#)) or phone number ([5.10.1.6](#)) must be populated in addition to the Owner Name ([5.10.1.4](#)). If the owner's address or phone number is not available, the user should enter the appropriate Country Name ([5.10.1.13](#)).

If the site is used, leased, or occupied by someone other than the owner, the name and other information for the user, lessee, or tenant should be entered in the Contact Record ([see section 5.10.2](#)). Enter the OWNR components as shown on the following page.

Sub-Section	Attribute Name	Description
5.10.1.1	site_owner_start_dt	Date of Ownership (C159)
5.10.1.2	site_owner_end_dt	End Date of Ownership (C374)
5.10.1.3	site_owner_cd	Site Owner Type (C350)
5.10.1.4	party_nm	Owner Name (C161)
5.10.1.5	party_alias_nm	Owner Alias Name (C360)
5.10.1.6	addr_phone_no	Owner Phone Number (C351)
5.10.1.7	accs_cd	Access to Owner Name (C352)
5.10.1.8	line_1_tx	Owner Address Line 1 (C353)
5.10.1.9	line_2_tx	Owner Address Line 2 (C354)
5.10.1.10	city_nm	Owner City Name (C355)
5.10.1.11	addr_post_cd	Owner Postal Code (C356)
5.10.1.12	zip_cd	Owner Zip Code (C357)
5.10.1.13	addr_country_nm	Owner Country Name (C358)
5.10.1.14	accs_cd	Access to Owner Phone/Address (C359)

Owner information cannot be used in detail testing. Information about this restriction is included in “Detailed Testing” in [Chapter 8](#).

5.10.1.1 Date of Ownership

(MGDODA/C159 - CHAR X(8) – site_owner_start_dt):

Enter the date that this owner acquired ownership of the well, spring, etc., or the earliest date on which this owner was known to own the source. If the day and/or month are not known, enter blanks in these spaces. Use leading zeros for month and day values less than ten. Specify all four digits of the year.

5.10.1.2 End Date of Ownership

(MGDOED/C374 - CHAR X(8) – site_owner_end_dt)

Enter the date that this owner relinquished ownership of the well, spring, etc., or the earliest date on which this owner was known to give up ownership. If the day and/or month are not known, enter blanks in these spaces. Use leading zeros for month and day values less than ten. Specify all four digits of the year.

5.10.1.3 Site Owner Type

(MGDOTP/C350 – MANDATORY Char X(2) – site_owner_cd)

Enter the site owner-type code.

Code	Description
CP	Corporation
GV	Government
IN	Individual
MI	Military
OT	Other
TG	Tribal/Indian Government
WS	Water Supplier

CP – Corporation:

Owner is a legal entity composed of one or more individuals acting as a single person. A local or national company owning an industrial or commercial facility is an example. Non-profit natural land trusts and land conservancies should be coded as corporations. Corporations that are water suppliers should be coded as a water supplier.

GV – Government:

Owner is a local, State, or federal agency. Government agencies providing water supply (a municipal water authority) should be coded as a water supplier. Government agencies providing wastewater treatment (a municipal sewer authority) should be coded as government. Federal- or state-recognized Indian tribal governments, including corporations wholly owned by tribal governments, should be coded as Indian tribal government.

IN – Individual:

Owner is an individual, or a group of individuals who are not a legal corporation.

MI – Military:

Owner is a branch of the U.S. Military.

OT – Other:

The type of owner is known and it is something other than a water supplier, corporation, individual, government, Indian tribal government, or military. For example, private-public partnerships should be coded as Other. The use of Other should be avoided if possible.

TG – Tribal/Indian Government:

Owner is a Federal- or State-recognized Indian tribal government, a subdivision of such, or a corporation wholly owned by a tribal government.

WS – Water Supplier:

Owner is a private or public entity that withdraws and/or distributes water to 25 or more residents or a minimum of 15 service connections. The National Water Use code for the site(s) should be “WS” to indicate public supply.

5.10.1.4 Owner Name**(MGDONM/C161 - MANDATORY CHAR X(64) -- party_nm):**

Enter the name of the owner. The owner is the person or entity that legally owns the well, gage structure, diversion structure, water-use facility, etc. Generally, the owner of a well is the owner of the land, but in some cases the well may have been drilled by and/or is the responsibility of another party such as the USGS. It is recommended that the entity with legal responsibility for the site be coded as the owner. If another entity controls access to the site location or needs to be contacted about the site, that entity can be entered as the Site Contact. The recommended format for entering an individual's name is: last name, first name, and middle initial. If a company's name will not fit into 64 characters, use meaningful abbreviations. This field can contain any combination of uppercase and lowercase letters (A-Z and a-z), numbers (0-9), spaces, periods(.), commas(,), hyphens(-), single quotation marks('), parentheses(), equal sign(=), ampersand(&), pound sign(#), plus sign(+), and backslash(\). An asterisk(*) is not allowed. This is a mandatory entry; if a name is not specified, ownership data will not be stored.

For an existing owner stored in the database, it is possible to enter a carriage return in the name field. At the bottom of the screen an 'Alias:' prompt appears. Each unique owner name and address is associated with an alias name that is usually the same as the owner's name. You can search for an existing owner by entering any number of characters in the 'Alias:' field. The

software will present owner names and addresses that partially match the characters entered and you may select one of the existing owners to be associated with the current site.

5.10.1.5 Owner Alias Name
(MGDOAL/C360 - CHAR X(64) -- party_alias_nm):

This field is automatically populated with the information from the Owner Name field. This component (C360) can be used during retrieval. During screen entry, the contents of this field can be searched if the name field is left blank and a carriage return is entered. See sections [5.10.1.4](#) and [5.10.2.3](#) for more information about accessing this field.

5.10.1.6 Owner Phone Number
(MGDOPH/C351 – CHAR X(24) – addr_phone_nm):

Enter owner’s phone number.

5.10.1.7 Access to Owner Name
(MGDOPA/C352 – MANDATORY CHAR X(1) –accs_cd):

This field controls the availability of owner’s name for retrieval in GWSI based on the setting of the retrieval restriction option, the function of which is equivalent to the Record-Ready-for-Web flag in other areas of the database. See [sections 1.4](#) and [8.2.4](#). The codes and their descriptions are:

Code	Description	Definition
0	Public access	Public access indicates that data are available to USGS employees, cooperators, and the general public.
1	Cooperator	Cooperator access indicates that data are available only to USGS employees, and specified cooperators.
2	USGS only	Non-district USGS access indicates that data are available only the USGS Employees.
3	District only	District USGS access indicates that data are available only to the local USGS District Employees.
4	Proprietary	Proprietary access indicates that data are restricted to specific USGS employees -- check with your DBA on use of this code.

The GWSI entry programs default the “Access to Owner Name” field to 3 – District Only.

5.10.1.8 Owner Address Line 1
(MGDOA1/C353 – CHAR X(64) – line_1_tx):

Enter first line of owner’s street address. Space is provided for 64 characters in the address. If more space is needed, enter remaining address information in component C354.

5.10.1.9 Owner Address Line 2
(MGDOA2/C354 – CHAR X(64) – line_2_tx):

Enter second line of owner’s street address if necessary. Space is provided for 64 characters in the address.

**5.10.1.10 Owner City Name
(MGDOCY/C355 – CHAR X(64) – city_nm):**

Enter city name in owner’s address. Space is provided for 64 characters for the city name.

**5.10.1.11 Owner Postal Code
(MGDOPC/C356 – CHAR X(2) – addr_post_cd):**

Enter the two-character state code abbreviation in owner’s address.

**5.10.1.12 Owner Zip Code
(MGDOZC/C357 – CHAR X(10) – zip_cd):**

Enter owner’s postal zip code. Space is provided for up to a ten-character zip code.

**5.10.1.13 Owner Country Name
(MGDOCN/C358 – CHAR X(48) – addr_country_nm):**

Enter country name in which the owner resides. Space is provided for up to a 48-character country name.

**5.10.1.14 Access to Owner Phone/Address
(MGDOAA/C359 – MANDATORY CHAR X(1) –accs_cd):**

This field controls the availability of owner’s address for retrieval in GWSI based on the setting of the retrieval restriction option, the function of which is equivalent to the Record-Ready-for-Web flag in other areas of the database See [sections 1.4](#) and [8.2.4](#). The codes and their descriptions are:

Code	Description	Definition
0	Public access	Public access indicates that data are available to USGS employees, cooperators, and the general public.
1	Cooperator	Cooperator access indicates that data are available only to USGS employees, and specified cooperators.
2	USGS only	Non-district USGS access indicates that data are available only the USGS Employees.
3	District only	District USGS access indicates that data are available only to the local USGS District Employees.
4	Proprietary	Proprietary access indicates that data are restricted to specific USGS employees -- check with your DBA on use of this code.

The GWSI entry programs default the Access to Owner Name field to 3 – District Only.

5.10.2 Contact Record -- MGD TYP = OCNT

Information on who to contact for information on or access to the site, if not the owner, is stored in the Contact record.

Data elements common to all Miscellaneous Data Records of the contact’s data record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

Source agency code	Date and time created
Site identification number	Person updating record
Record type (OCNT)	Date and time of last update
Record sequence number	Record ready for Web
Person creating record	

In order for NWIS to store OCNT records, one of the address fields (5.10.2.7-5.10.2.12) or phone number (5.10.2.5) must be populated in addition to the Contact Name (5.10.2.5). If the contact’s address or phone number is not available, the user should enter the appropriate Contact Country Name (5.10.2.12).

Entry of the contact’s data is identified by coding "OCNT" in the type of miscellaneous record. Enter the OCNT components as follows:

Sub-Section	Attribute Name	Description
5.10.2.1	site_contact_start_dt	Date of Contact (C361)
5.10.2.2	site_contact_end_dt	End Date of Contact (C373)
5.10.2.3	party_nm	Contact Name (C362)
5.10.2.4	party_alias_nm	Contact Alias Name (C372)
5.10.2.5	addr_phone_no	Contact Phone Number (C363)
5.10.2.6	accs_cd	Access to Contact Name (C364)
5.10.2.7	line_1_tx	Contact Address Line 1 (C365)
5.10.2.8	line_2_tx	Contact Address Line 2 (C366)
5.10.2.9	city_nm	Contact City Name (C367)
5.10.2.10	addr_post_cd	Contact Postal Code (C368)
5.10.2.11	zip_cd	Contact Zip Code (C369)
5.10.2.12	addr_country_cd	Contact Country Name (C370)
5.10.2.13	accs_cd	Access to Contact Phone/Address (C371)

Contact information cannot be retrieved by using the GWSI retrieval software. Information about this restriction is included in “Detailed Testing” in [Chapter 8](#).

5.10.2.1 Date of Contact

(MGDODA/C361 - CHAR X(8) -- site_contact_start_dt):

Enter the date that this contact was established. If the day and/or month are not known, enter blanks in these spaces. Use leading zeros for month and day values less than ten. Specify all four digits of the year.

5.10.2.2 End Date of Contact**(MGDOED/C373 - CHAR X(8) -- site_contact_end_dt):**

Enter the date that this contact was no longer valid for the site, or the earliest date on which this contact was known to be invalid. If the day and/or month are not known, enter blanks in these spaces. Use leading zeros for month and day values less than ten. Specify all four digits of the year.

5.10.2.3 Contact Name**(MGDONM/C362 - MANDATORY CHAR X(64) -- party_nm):**

Enter the name of the contact. The recommended format for entering an individual's name is: last name, first name, and middle initial. If a company's name will not fit into 64 characters, use meaningful abbreviations. This field can contain any combination of uppercase and lowercase letters (A-Z and a-z), numbers (0-9), spaces, periods(.), commas(,), hyphens(-), single quotation marks('), parentheses(), equal sign(=), ampersand(&), pound sign(#), plus sign(+), and black slash(\). An asterisk(*) is not allowed. This is a mandatory entry; if a name is not specified, owner contact data will not be stored.

If you would like to search the alias names already stored in the database, include no character information and enter a carriage return in the name field. At the bottom of the screen an 'Alias:' prompt appears. At this prompt, enter any number of characters in the name of interest. The software will present those entries that match the characters entered and you may select one of those or enter your own. For more information about the alias field please see section [5.10.2.4](#).

5.10.2.4 Contact Alias Name**(MGDOAL/C372 - CHAR X(64) -- party_alias_nm):**

This field is automatically populated with the information from the Contact Name field, and is used by GWSI to select a unique contact record on modify transactions. This component (C372) can be used during retrieval. During screen entry, the contents of this field can be searched if the name field is left blank and a return is entered. See sections [5.10.1.4](#) and [5.10.2.3](#) for more information about accessing this field.

5.10.2.5 Contact Phone Number**(MGDOPH/C363 – CHAR X(24) – addr_phone_no):**

Enter contact's phone number.

5.10.2.6 Access to Contact Name**(MGDOPA/C364 – MANDATORY CHAR X(1) –accs_cd):**

This field controls the availability of the contact's name for retrieval in GWSI based on the setting of the retrieval restriction option, the function of which is equivalent to the

Record-Ready-for-Web flag in other areas of the database See [sections 1.4](#) and [8.2.4](#).
The codes and their descriptions are:

Code	Description	Definition
0	Public access	Public access indicates that data are available to USGS employees, cooperators, and the general public.
1	Cooperator	Cooperator access indicates that data are available only to USGS employees and specified cooperators.
2	USGS only	Non-district USGS access indicates that data are available only the USGS Employees.
3	District only	District USGS access indicates that data are available only to the local USGS District Employees.
4	Proprietary	Proprietary access indicates that data are restricted to specific USGS employees-check with your DBA on use of this code.

The GWSI entry programs default the Access to Contact Name field to 3 – District Only

5.10.2.7 Contact Address Line 1
(MGDOA1/C365 – CHAR X(64) – line_1_tx):

Enter first line of contact’s street address. Space is provided for 64 characters in the address. If more space is needed, enter remaining address information in component C354.

5.10.2.8 Contact Address Line 2
(MGDOA2/C366 – CHAR X(64) – line_2_tx):

Enter second line of contact’s street address if necessary. Space is provided for 64 characters in the address.

5.10.2.9 Contact City Name
(MGDOCY/C367 – CHAR X(64) – city_nm):

Enter city name in contact’s address. Space is provided for 64 characters for the city name.

5.10.2.10 Contact Postal Code
(MGDOPC/C368 – CHAR X(2) – addr_post_cd):

Enter the two-character state code abbreviation in contact’s address.

5.10.2.11 Contact Zip Code
(MGDOZC/C369 – CHAR X(10) – zip_cd):

Enter contact’s postal zip code. Space is provided for up to ten-character zip code.

**5.10.2.12 Contact Country Name
(MGDOCN/C370 – CHAR X(48) – addr_country_cd):**

Enter country name in which the contact resides. Space is provided for up to 48-character country name.

**5.10.2.13 Access to Contact Phone/Address
(MGDOCN/C371 – MANDATORY CHAR X(1) –accs_cd):**

This field controls the availability of the contact’s address for retrieval in GWSI based on the setting of the retrieval restriction option, the function of which is equivalent to the Record-Ready-for-Web flag in other areas of the database See [sections 1.4](#) and [8.2.4](#). The codes and their descriptions are listed on the following page.

Code	Description	Definition
0	Public access	Public access indicates that data are available to USGS employees, cooperators, and the general public.
1	Cooperator	Cooperator access indicates that data are available only to USGS employees and specified cooperators.
2	USGS only	Non-district USGS access indicates that data are available only the USGS Employees.
3	District only	District USGS access indicates that data are available only to the local USGS District Employees.
4	Proprietary	Proprietary access indicates that data are restricted to specific USGS employees-check with your DBA on use of this code.

The GWSI entry programs default the Access to Contact Name field to 3 – District Only

5.10.3 Other Identifiers File Record -- MGD TYP = OTID

Sub-Section	Attribute Name	Description
5.10.3.1	otid_id	Other identifier (C190) MANDATORY
5.10.3.2	assigner_nm	Assigner (C191) MANDATORY

Data elements common to all Miscellaneous Data Records of the other identifier's data record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

- | | |
|------------------------|------------------------------|
| Source agency code | Site identification number |
| Record type (OTID) | Record sequence number |
| Person creating record | Date and time created |
| Person updating record | Date and time of last update |
| Record ready for Web | |

The entry of other site identification numbers is identified by coding "OTID" in the type of miscellaneous record. This record provides for recording identifying numbers or

names assigned to the sites by other agencies or individuals. The COOP record provides another means of defining other site identifiers. Enter the OTID components as follows:

5.10.3.1 Other Identifier

(MGDROID/C190 - MANDATORY SECONDARY-KEY CHAR X(15) -- otid_id):

Enter the name or number by which the site is identified. This is a mandatory data element; data will not be stored if this field is blank.

5.10.3.2 Assigner

(MGDOIA/C191 - SK3 - MANDATORY CHAR X(15) -- assigner_nm):

Enter the name 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 record 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 ensure 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 record. This is a mandatory entry.

5.10.4 Other-Data-Available Record -- MGD TYP = OTDT

Sub-Section	Attribute Name	Description
5.10.4.1	otdt_tx	Other data type (C181) MANDATORY
5.10.4.2	otdt_loc_cd	Other data location (C182)
5.10.4.3	otdt_format_cd	Format of other data (C261)

Data elements common to all Miscellaneous Data Records of the other-data-available record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

- | | |
|------------------------|------------------------------|
| Source agency code | Site identification number |
| Record type (OTDT) | Record sequence number |
| Person creating record | Date and time created |
| Person updating record | Date and time of last update |
| Record ready for Web | |

The other-data-available record is used to indicate the availability of additional data pertinent to the site. The entry of other-data-available data is identified by coding "OTDT" in the type of miscellaneous record. Enter the OTDT components as follows:

5.10.4.1 Other Data Type

(MGDODT/C181 - MANDATORY CHAR X(38) -- otdt_tx):

Describe the type of data available for the site. Use meaningful abbreviations if needed. This field is mandatory; other available data information will not be stored if this field is blank.

5.10.4.2 Other Data Location

(MGDODL/C182 - CHAR X(1) -- otdt_loc_cd):

Enter the code that identifies the location of the data. The codes are:

Code	Description
C	Cooperator office
D	District office (USGS only)
R	Reporting agency office
Z	Other (explain in remarks)

5.10.4.3 Format

(MGDODF/C261 - CHAR X(1) -- otdt_format_cd):

Enter the code that best describes the form in which the data are stored. The codes and their descriptions are listed on the following page.

Code	Description
F	Files (raw data)
M	Machine readable
P	Published (report or basic data release)
Z	Other (explain in remarks)

5.10.5 Site-Visits Record -- MGD TYP = VIST

Sub-Section	Attribute Name	Description
5.10.5.1	vist_dt	Date of visit (C187) MANDATORY
5.10.5.2	vist_person_nm	Person who made visit (C188)

Data elements common to all Miscellaneous Data Records of the site-visits data record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

- | | |
|------------------------|------------------------------|
| Source agency code | Site identification number |
| Record type (VIST) | Record sequence number |
| Person creating record | Date and time created |
| Person updating record | Date and time of last update |
| Record ready for Web | |

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

The entry of site-visit data is identified by coding "VIST" in the type of miscellaneous record. Enter the VIST components as follows:

5.10.5.1 Date of Visit

(MGDVDT/C187 - MANDATORY CHAR X(8) -- vist_dt):

Enter the date on which the site was visited. Use leading zeros for values of day or month less than ten. Specify all four digits for the year. This entry is mandatory.

5.10.5.2 Name of Person

(MGDVPN/C188 - CHAR X(22) -- vist_person_nm):

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 and do not include periods. For example, Charlie Arthur Brown would be entered as BROWNbCbA (b=blank).

5.10.6 Field Water-Quality Record

Entry of water-quality data is completed from GWSI by using the QWDATA menu system. Option 12 from the main GWSI menu allows for input of water-quality data via QWDATA. Details about the use of this program are available in [Chapter 3.1.10](#).

5.10.7 Geophysical-Logs Record -- MGD TYP = LOGS

Sub-Section	Attribute Name	Description
5.10.7.1	logs_cd	Type of Log (C199) MANDATORY
5.10.7.2	logs_top_va	Depth to Top of Logged Interval (C200)
5.10.7.3	logs_bottom_va	Depth to Bottom of Logged Interval (C201)
5.10.7.4	logs_src_cd	Source of Log Data (C202)
5.10.7.5	logs_format_cd	Format of Log Data (C225)
5.10.7.6	logs_loc_nm	Location of Log Data (C226)

Data elements common to all Miscellaneous Data Records of the geophysical-logs data record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

Source agency code	Site identification number
Record type (LOGS)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update
Record ready for Web	

The logs record is used to enter information about types of geophysical or other logs available for the site. The entry of geophysical logs data is identified by coding "LOGS" in the type of miscellaneous record. Enter the LOGS components as follows:

5.10.7.1 Type of Log

(MGDLTY/C199 - MANDATORY SECONDARY-KEY CHAR X(2) logs_cd):

Enter the code that best describes the log type. This field is mandatory. The codes are:

Code	Description	Code	Description
	ACOUSTIC LOG		ELECTROMAGNETIC LOG
AS	Sonic log	MM	Magnetic log
AV	Acoustic velocity log	MS	Magnetic susceptibility log
AW	Acoustic waveform log	MI	Electromagnetic induction log
AT	Acoustic televiewer log	MD	Electromagnetic dual induction log
	CALIPER LOG	MR	Radar reflection image log
CP	Caliper log	MV	Radar direct-wave velocity log
CS	Caliper, single arm log	MA	Radar direct-wave amplitude log
CT	Caliper, three arm log		FLUID LOG
CM	Caliper, multiple arm log	FH	Heat-pulse flowmeter log
CA	Caliper, acoustic log	FE	Electromagnetic flowmeter log
	DRILLING LOG	FD	Doppler flowmeter log
DT	Drilling time log	FA	Radioactive tracer log
DR	Drillers log	FY	Dye tracer log
DG	Geologists log	FB	Brine tracer log
DC	Core log	FC	Fluid conductivity log
	ELECTRIC LOG	FR	Fluid resistivity log
EE	Electric log	FT	Fluid temperature log
ER	Single-point resistance log	FF	Fluid differential temperature log
EP	Spontaneous potential log	FV	Fluid velocity log
EL	Long-normal resistivity log	FS	Spinner flowmeter log
ES	Short-normal resistivity log		NUCLEAR LOG
ET	Lateral resistivity log	NG	Gamma log
EN	Microresistivity log	NS	Spectral gamma log
EC	Microresistivity, focused log	NA	Gamma-gamma log
EO	Microresistivity, lateral log	NN	Neutron log
ED	Dipmeter log	NT	Neutron activation log
		NM	Nuclear magnetic resonance log

Log Type Codes (continued from previous page)

Code	Description	Code	Description
	OPTICAL LOG		COMBINATION LOG
OV	Video log	ZF	Gamma, fluid resistivity, and temperature log
OF	Fisheye video log	ZI	Gamma and EM induction log
OS	Sidewall video log	ZR	Long/short normal resistivity log
OT	Optical televiewer log	ZT	Fluid resistivity and temperature log
	WELL CONSTRUCTION LOG	ZM	EM flowmeter, fluid resistivity, and temperature log
WC	Casing collar log	ZN	Long/short normal resistivity, and spontaneous potential log
WD	Borehole deviation log	ZP	Single-point resistance and spontaneous potential log
	OTHER	ZP	Single-point resistance and spontaneous potential log
OR	Other log	ZE	Gamma, long/short normal resistivity, spontaneous potential, single-point resistance, fluid resistivity, and temperature log.

5.10.7.2 Beginning Depth

(MGDLTP/C200 - CHAR X(8) -- logs_top_va):

Enter the depth to the top of the logged interval in feet below land surface.

5.10.7.3 Ending Depth

(MGDLBT/C201 - CHAR X(8) -- logs_bottom_va):

Enter the depth to the bottom of the logged interval, in feet below land surface.

5.10.7.4 Source of Log Data

(MGDLSC/C202 - CHAR X(1) -- logs_src_cd):

Enter the code that indicates who provided the information. The codes are the same as those used for source-of-depth data. (defined in section [Source of Depth Data – Section 1.53](#))

5.10.7.5 Format of Log Data

(MGDLFM/C225 – CHAR X(1) – logs_format_cd):

Enter the code that indicates the format in which the Log Data are stored. The codes are:

Code	Description
F	Files (raw data)
M	Machine readable
P	Published (report or basic data release)
Z	Other (explain in remarks)

5.10.7.6 Location of Log Data (MGDLLC/C226 – CHAR X(64) – logs_loc_nm):

Enter a narrative description of the location of any additional geophysical logs data.

5.10.8 Networks Record -- MGD TYP = NETW

Sub-Section	Attribute Name	Description
5.10.8.1	netw_cd	Data type (QW-WL-WD) (C706) MANDATORY
5.10.8.2	netw_begin_dt	Begin year of data collection (C115) MANDATORY
5.10.8.3	netw_end_dt	End year of data collection (C116)
5.10.8.4	analyses_tp	Type of analyses (C120) (water-quality only)
5.10.8.5	netw_src_cd	Source agency for network data (C117)
5.10.8.6	netw_freq_cd	Frequency of data collection (C118)
5.10.8.7	netw_meth_cd	Method of data collection (C133) (Withdrawal only)
5.10.8.8	anal_agency_cd	Agency that analyzes samples (water-quality only) (C307)
5.10.8.9	netw_1_cd	Network—Primary (C257)
5.10.8.10	netw_2_cd	Network-Secondary (C708)

Data elements common to all Miscellaneous Data Records of the networks data record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

- Source agency code
- Site identification number
- Record type (NETW)
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The networks record is used to indicate the availability of the site as an established data-collection station for water-quality, water-level, or withdrawal data. If there are periods of significant interruption in the measurements or if the frequency of measurement changes, multiple entries may be reported to reflect the variations.

The entry of network data is identified by coding “NETW” in the type of miscellaneous record. Enter the NETW components as follows:

5.10.8.1 Type of Network

(MGDNDT/C706 - MANDATORY SECONDARY-KEY CHAR X(2) -- netw_cd):

Enter the code for the type of network. This component is mandatory for the entry of network data. The following codes are valid:

- QW** -Water-quality network station
- WL** -Water-levels network station
- WD** - Pumpage or withdrawals network station

5.10.8.2 Beginning Year

(MGDNBY/C115 - MANDATORY CHAR X(4) -- netw_begin_dt):

Enter the year in which the data collection began at the site. Use four digits. Begin year is mandatory; information about data collection will not be stored if this field is blank.

5.10.8.3 Ending Year

(MGDNEY/C116 - CHAR X(4) -- netw_end_dt):

Enter the year in which the data collection was ended at the site. Use four digits. If the site is currently monitored, leave this field blank.

5.10.8.4 Type of Analysis

(MGDNTY/C120 - CHAR X(2) -- analyses_tp):

Enter the code that indicates the type of water-quality data generally collected at the site. This is a two-character field; if two types of water-quality data are collected, code both. The codes and their descriptions are:

Code	Description
A	Physical properties
B	Common ions
C	Trace elements
D	Pesticides
E	Nutrients
F	Sanitary analysis (organisms)
G	Pesticides and common ions
H	Nutrients and common ions
I	Common ions/trace elements
J	Sanitary analysis and common ions
K	Pesticides and nutrients
L	Trace elements, pesticides and nutrients
M	All or most of the above
N	Common ions, trace elements and radioactive
P	Common, trace, and physical
Z	Other (explain in remarks)

5.10.8.5 Source Agency For Network Data
(MGDNSC/C117 - CHAR X(5) -- netw_src_cd):

Enter the code identifying the principal agency responsible for collection of data. This field is mandatory only if necessary to uniquely identify the data-collection network of more than one agency.

5.10.8.6 Frequency of Collection
(MGDNFQ/C118 - CHAR X(1) -- netw_freq_cd):

Enter the code indicating frequency with which data are collected at the site. The codes and their frequencies are:

Code	Frequency	Code	Frequency
A	Annually	S	Semiannually
B	Bimonthly (every 2 months)	W	Weekly
C	Continuously (recorder)	Z	Other (explain in remarks)
D	Daily	2	Every 2 years
F	Semimonthly (twice a month)	3	Every 3 years
I	Intermittently	4	Every 4 years
M	Monthly	5	Every 5 years
O	One time only	X	Every 10 years
Q	Quarterly		

5.10.8.7 Method of Collection
(MGDNMT/C133 - CHAR X(1) -- netw_meth_cd):

Enter the code indicating the method by which water-withdrawal data are collected at the site. The codes are:

Code	Description
C	Calculated from power-consumption records
E	Estimated
M	Metered
U	Unknown
Z	Other (explain in remarks)

5.10.8.8 Analyzing Agency
(MGDNAA/C307 - CHAR X(5) -- anal_agency_cd):

Enter up to five characters to indicate what agency performed the water-quality analyses for data from this site. **Note: This field is not attached to any data in the water-quality database. Any entries in this field should be checked against similar information entered in the QW database.**

**5.10.8.9 Primary Network Site
(MGDNT1/C257 - CHAR X(1) -- netw_1_cd):**

Enter one of the codes listed below to indicate the management level of the network. If more than one network for an individual agency (defined in section [Source Agency for Network Data – Section 5.10.8.5](#)) is entered, this field is mandatory in the GWSI database.

Following are the codes and their descriptions:

Code	Description
1	National
2	District
3	Project
4	Cooperator

**5.10.8.10 Secondary Network Site
(MGDNT2/C708 - CHAR X(1) -- netw_2_cd):**

This component provides each District with an additional field to better define District-specific networks. No allowable codes are defined at the national level, and each District can define codes for their individual systems. Ignore this field if it is not needed.

5.10.9 Special-Cases Record -- MGD TYP = SPEC

Sub-Section	Attribute Name	Description
5.10.9.1	wells_nu	Number of wells/laterals in a group (C204, 220)
5.10.9.2	deepest_well_va	Depth of deepest well in group (C205)
5.10.9.3	shallowest_well_va	Depth of shallowest well in group (C206)
5.10.9.4	spec_cons_meth_cd	Method wells in group constructed (C207)
5.10.9.5	group_dia_va	Diameter of well group (C262)
5.10.9.6	ptd_len_va	Length of pond, tunnel, or drain (C209)
5.10.9.7	ptd_width_va	Width of pond, tunnel, or drain (C210)
5.10.9.8	ptd_depth_va	Depth of pond, tunnel, or drain (C211)
5.10.9.9	ptd_bearing_va	Bearing (azimuth) of pond, tunnel, or drain (C263)
5.10.9.10	dip_va	Dip of tunnel (C264)
5.10.9.11	lateral_depth_va	Depth of lateral in collector well (C221)
5.10.9.12	lateral_len_va	Length of lateral in collector well (C222)
5.10.9.13	lateral_dia_va	Diameter of lateral in collector well (C223)
5.10.9.14	lateral_mesh_va	Mesh of screen in lateral (C224)
5.10.9.15	Spec_rmk_tx	Remarks (C265)

Data elements common to all Miscellaneous Data Records of the special-cases data record are entered following the instructions in sections 5.1 through 5.9. A brief review is listed on the following page:

Source agency code
 Site identification number
 Record type (SPEC)
 Record sequence number
 Person creating record
 Date and time created
 Person updating record
 Date and time of last update
 Record ready for Web

The special-cases record is used to record data about multiple wells, ponds, tunnels, drains, and laterals or collector wells. The entry of special-cases data is identified by coding "SPEC" in the type of miscellaneous record. Enter the SPEC components as follows:

5.10.9.1 Number Wells/Laterals In Group
(MGDSWN/C204, C220 - CHAR X(3) -- wells_nu):

Enter the number of wells that make up this well group. Note: Existing GWSI control files that contain component C220 will continue to work. New control files should use C204.

5.10.9.2 Depth of Deepest Well
(MGDSWD/C205 - CHAR X(3) -- deepest_well_va):

Enter the depth of the deepest well in the group, in feet below land surface.

5.10.9.3 Depth of Shallowest Well
(MGDSWS/C206 - CHAR X(3) -- shallowest_well_va):

Enter the depth of the shallowest well in the group, in feet below land surface.

5.10.9.4 Method Wells Constructed
(MGDSWM/C207 - CHAR X(1) -- spec_cons_meth_cd):

Enter the code indicating the method by which the wells were constructed. The codes are:

Code	Description
D	Drilled
J	Jetted
V	Driven
W	Drive-wash
Z	Other

5.10.9.5 Diameter of Well Group
(MGDSWZ/C262 - CHAR X(7) -- group_dia_va):

Enter the mean diameter of the well field, in feet; that is, the diameter of a circle that will enclose the well group.

5.10.9.6 Length of Pond, Tunnel, or Drain
(MGDSPL/C209 - CHAR X(5) -- ptd_len_va):

Enter whichever of the following is applicable (in feet): the length of a tunnel or drain, the longer dimension of a noncircular pond, or the diameter of a circular pond.

5.10.9.7 Width of Pond, Tunnel, or Drain
(MGDSPW/C210 - CHAR X(3) -- ptd_width_va):

Enter whichever of the following is applicable (in feet): the width of a drain or noncircular tunnel, the diameter of a circular tunnel, or the shorter dimension of a noncircular pond.

5.10.9.8 Depth of Pond, Tunnel, or Drain
(MGDSPD/C211 - CHAR X(3) -- ptd_depth_va):

Enter whichever of the following is applicable (in feet): the depth of a drain, the height of a noncircular tunnel, or the average depth of a pond.

5.10.9.9 Azimuth of Pond, Tunnel, or Drain
(MGDSPB/C263 - CHAR X(3) -- ptd_bearing_va):

Enter the orientation of a tunnel or drain or of the long dimension of a noncircular pond, in degrees bearing from true north. Azimuth is measured clockwise; north is 0, east is 90, south is 180, and west is 270.

5.10.9.10 Dip of Tunnel
(MGDSPA/C264 - CHAR X(3) -- dip_va):

Enter the dip of a tunnel in degrees above or below (-) the horizontal.

5.10.9.11 Depth to Lateral
(MGDSLID/C221 - CHAR X(3) -- lateral_depth_va):

Enter the depth to the lateral, in feet below land surface.

5.10.9.12 Length of Lateral
(MGDSLID/C222 - CHAR X(3) -- lateral_len_va):

Enter the length of the lateral, in feet.

5.10.9.13 Diameter of Lateral
(MGDSL/C223 - CHAR X(3) -- lateral_dia_va):

Enter the diameter of the lateral, in inches.

5.10.9.14 Lateral Screen Mesh
(MGDSL/C224 - CHAR X(3) -- lateral_mesh_va):

Enter the mesh of the lateral screen, in inches.

5.10.9.15 Remarks
(MGDSRK/C265 – VARCHAR X(256) – spec_rmk_tx

Enter any comments or remarks pertaining to this record or the acquisition of the data.
 NOTE: Because of the 256 character field length, the only ways to view these remarks in full are (a) on screen using the Screen Entry program; and (b) in a Subfile table using RDB format. Be aware when using the Subfile RDB format, the limit per record is 1,000 characters, so the total field length of all the components requested for tabling should not exceed 1,000 characters. A standard retrieval cannot display this field. A dump retrieval truncates this field.

5.10.10 Miscellaneous Values Record -- MGDTYP = MSVL

Sub-Section	Component Name	Description
5.10.10.1	msvl_1_va	Miscellaneous value 1 (C251)
5.10.10.2	msvl_2_va	Miscellaneous value 2 (C252)
5.10.10.3	msvl_3_va	Miscellaneous value 3 (C253)
5.10.10.4	msvl_4_va	Miscellaneous value 4 (C314)
5.10.10.5	Msvl_rmk_tx	Remarks (C266)

Data elements common to all Miscellaneous Data Records of the miscellaneous-values data record are entered following the instructions in sections 5.1 through 5.9. A brief review is listed on the following page.

- Source agency code
- Site identification number
- Record type (MSVL)
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

For those users who want to enter data that are not of national significance but are essential to their operation, the MISC VALUES record is available. The entry of

miscellaneous-values data is identified by coding "MSVL" in the type of miscellaneous record. Enter the MSVL components as follows:

5.10.10.1 Miscellaneous Value One
(MGDMV1/C251 - CHAR X(7) -- msvl_1_va):

This is a real number with two numbers allowed to the right of the decimal. The value will not be edited except for format consistency.

5.10.10.2 Miscellaneous Value Two
(MGDMV2/C252 - CHAR X(11) -- msvl_2_va):

This is a character-type component. The value will not be edited except for format consistency.

5.10.10.3 Miscellaneous Value Three
(MGDMV3/C253 - CHAR X(10) -- msvl_3_va):

This is a character-type component. The value will not be edited except for format consistency.

5.10.10.4 Miscellaneous Value Four
(MGDMV4/C314 - CHAR X(7) -- msvl_4_va):

This is an integer component with an allowance of a length of seven digits. The value will not be edited except for format consistency.

5.10.10.5 Remarks
(MGDMRK/C266 – VARCHAR X(256) – msvl_rmk_tx

Enter any comments or remarks pertaining to this record or the acquisition of the data. NOTE: Because of the 256 character field length, the only ways to view these remarks in full are (a) on screen using the Screen Entry program; and (b) in a Subfile table using RDB format. Be aware when using the Subfile RDB format, the limit per record is 1,000 characters, so the total field length of all the components requested for tabling should not exceed 1,000 characters. A standard retrieval cannot display this field. A dump retrieval truncates this field.

5.10.11 Cooperator Data Record -- MGD TYP = COOP

Sub-Section	Attribute Name	Description
5.10.11.1	Coop_site_no	Cooperator Site ID (C213)
5.10.11.2	Registration_no_va	Contractor registration number (C214)
5.10.11.3	Coop_stat_cd	Inspection status (C215)
5.10.11.4	Unapproved_cd	Reason unapproved (C216)
5.10.11.5	Coop_inspect_dt	Date inspected (C217)
5.10.11.6	Coop_remark_tx	Cooperator remarks (C218)

Data elements common to all Miscellaneous Data Records of the Cooperator Data Record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

Source agency code	Site identification number
Record type (COOP)	Record sequence number
Person creating record	Date and time created
Person updating record	Date and time of last update
Record ready for Web	

The Cooperator Data Record is provided for entering data not included on other schedules. The entry of the cooperator's data is identified by coding "COOP" in the type of miscellaneous record. Enter the COOP components as follows:

5.10.11.1 Cooperator Site ID
(MGDCID/C213 - CHAR X(10) -- coop_site_no):

Enter the identification number used by the cooperating agency for the site, if different from the local well number.

5.10.11.2 Registration No.
(MGDCRN/C214 - CHAR X(12) -- registration_no_va):

Enter the registration or license number of the individual or firm that constructed the well or other type of site. The following are characters not allowed in this field:

* \ “ ^

Blanks are allowed.

5.10.11.3 Inspection Status
(MGDCST/C215 - CHAR X(2) -- coop_stat_cd):

Enter a code indicating whether or not the site has been inspected and approved. Cooperators can create their own set of meaningful codes, depending on the requirements of their agency.

5.10.11.4 Reason Unapproved
(MGDCAP/C216 - CHAR X(1) -- unapproved_cd):

Enter a code indicating the reason why an inspected and unapproved site was not approved. Each cooperator can create his or her own set of meaningful codes, depending on the requirements of the agency.

**5.10.11.5 Inspection Date
(MGDCIN/C217 - CHAR X(8) -- coop_inspect_dt):**

Enter the date on which the site was inspected by cooperator personnel. Use leading zeros for month and day less than ten, and four digits for year.

**5.10.11.6 Cooperator Remarks
(MGDCRK/C218 - CHAR X(25) -- coop_remark_tx):**

Enter any additional pertinent cooperator data.

5.10.12 Remarks Record -- MGD TYP = RMKS

Sub-Section	Attribute Name	Description
5.10.12.1	rmks_dt	Remark date (C184)
5.10.12.2	rmks_tx	Remark (C185)

Data elements common to all Miscellaneous Data Records of the remarks data record are entered following the instructions in sections 5.1 through 5.9. Here is a brief review for your convenience:

- | | |
|------------------------|------------------------------|
| Source agency code | Site identification number |
| Record type (RMKS) | Record sequence number |
| Person creating record | Date and time created |
| Person updating record | Date and time of last update |
| Record ready for Web | |

The entry of remarks data is identified by coding "RMKS" in the type of miscellaneous record. Enter the RMKS components as follows:

**5.10.12.1 Remark Date
(MGDRDT/C184 -CHAR(8) -- rmks_dt):**

This is the date pertaining to the origin of the remark.

**5.10.12.2 Remarks
(MGDRMK/C185 - CHAR X(256) -- rmks_tx):**

The remarks record is provided for entering meaningful data for which no specific field is available. Data in this field will be stored exactly as punched, together with the date of entry and sequence number. Use this space to explain entries of “other” for coded fields on the schedule, and to enter any other pertinent comments about the site.

For each comment, a three-digit sequence number is required (MGDSEQ) so that individual comments in the remarks record may be deleted or modified without affecting other entries. This field is mandatory.

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

1. Start each remark with the number of the field it relates to in the first three or four positions of its remark.
2. Follow this with the values that uniquely identify the appropriate record occurrence, if applicable.
3. Continue the remark to subsequent entries.

NOTE: Because of the 256 character field length, the only ways to view these remarks in full are (a) on screen using the Screen Entry program; and (b) in a Subfile table using RDB format. Be aware when using the Subfile RDB format, the limit per record is 1,000 characters, so the total field length of all the components requested for tabling should not exceed 1,000 characters. A standard retrieval cannot display this field. A dump retrieval truncates this field.

Section 6. Geohydrologic Units File Components

Sub-Section	Description
6.1	Source agency code (C4) MANDATORY
6.2	Site identification number (C1) MANDATORY
6.3	Record type (C748, C750) MANDATORY
6.4	Record sequence number or sequence number of parent (C721, C256) MANDATORY
6.5	Record sequence number of child (for AQFR only) (C742) MANDATORY
6.6	Person creating record (C466,C469)
6.7	Date and time created (C467,C470)
6.8	Person updating record (C468,C471)
6.9	Date and time of last update (C749,C751)
6.10	Record ready for Web (C871,C872)
6.11	Data dependent on record type

The GEOHYDROLOGIC UNITS record is used for recording geohydrologic data about the site. Types of sites that have access to the GEOHYDROLOGIC UNITS record include glacier (GL), ocean (OC), lake (LK), spring (SP), ground-water (GW), subsurface (SB), land (LA), facilities (FA-), wetland (WE), and estuary (ES). The record can be used to record as little as the principal aquifer, or as much as an entire log for the site. Each entry of this record describes a geohydrologic interval. The interval is not necessarily an entire formation or an entire aquifer. The following is a list of the component codes used in the GEOHYDROLOGIC UNIT data file.

Record Type	Description of Contents	Data Table Name
GEOH	Includes geohydrologic description and depth interval	gw_geoh_##
AQFR	Includes the water level and contribution	gw_aqfr_##

The related GEOHYROLOGIC UNIT records have two record types and form a parent/child relationship. GEOH is the parent record to related AQFR child records; the GEOH record must be established before any AQFR records can be entered. The first characters of the record are coded as follows:

6.1 Source Agency Code

(LGAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

This is the agency that is the source of the site data. The Source Agency Code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. For a detailed description see [Section 1.1](#).

6.2 Site Identification Number

(LGID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

This is the 2 to 15-digit site identification (Site ID) number of the site to which the geohydrologic unit data applies. If the site has not been entered into the Sitefile, this operation must be completed before the geohydrologic unit data are input. The Site ID number is mandatory and a part of the primary key. For a detailed description see [Section 1.2](#).

6.3 Record Type

(LGTYP/C748,C750 - MANDATORY SECONDARY-KEY CHAR X (4)):

The RECORD TYPE identifies the category of data included in the record. There are two categories with the GEOHYDROLOGIC data. This field is mandatory and is a secondary key. The categories are as follows:

Record Type	Description
GEOH	Geohydrologic units record C748
AQFR	Aquifers record C750

6.4 Record Sequence Number or Sequence Number of Parent

(LGSEQ/C721,C256 - MANDATORY PRIMARY-KEY CHAR X(3) -- geoh_seq_nu):

This is a number assigned at time of data entry to keep data by category in logical order. This number is mandatory and a part of the primary key. The component number for the record sequence number depends on the record type as follows:

Record	Description	Attribute Name
GEOH	Geohydrologic units record	geoh_seq_nu
AQFR	Aquifers record	geoh_seq_nu

6.5 Record Sequence Number of Child (for AQFR only)

(LGCSEQ/C742 - MANDATORY PRIMARY-KEY CHAR X(3) -- aqfr_seq_nu):

Each aquifers record described for a site must have a unique identifying number in this space. The numbers need not be in sequence, but each can be used only once for that site. The entry number is mandatory; aquifers record will not be stored if the field is blank. This field relates each aquifers record to the correct parent GEOHYDROLOGIC UNITS record, and the sequence number entered in this field must match the sequence number (geoh_seq_nu) of the related GEOH record.

6.6 Person Creating Record
(LGCUID/C466,C469 - CHAR X(8) -- geoh_cn or aqfr_cn):

This contains the user identification of the person creating the record. The user ID is entered automatically by the NWIS software. The component number for the person creating the record depends on the record type as follows:

Record	Description	Attribute Name
GEOH	Geohydrologic units record	geoh_cn
AQFR	Aquifers record	aqfr_cn

6.7 Date and Time Created
(LGCRDT/C467,C470 - CHAR X(14) -- geoh_cr or aqfr_cr):

This contains the date and time the record was created. The date and time are entered automatically by the NWIS software. The component number for the date the record was created depends on the record type as follows:

Record	Description	Attribute Name
GEOH	Geohydrologic units record	geoh_cr
AQFR	Aquifers record	aqfr_cr

6.8 Person Updating Record
(LGUID/C468,C471 - CHAR X(8) -- geoh_mn or aqfr_mn):

This contains the user identification of the person who last updated the record. The user ID is entered automatically by the NWIS software. The component number for the user ID of the person creating the record depends on the record type as follows:

Record	Description	Attribute Name
GEOH	Geohydrologic units record	geoh_mn
AQFR	Aquifers record	aqfr_mn

6.9 Date and Time of Last Update
(LGUPDT/C749,C751 - CHAR X(14) -- geoh_md or aqfr_md):

This contains the date and time when the data record was last updated. The date and time are entered automatically by the NWIS software. The component number for the date of the last update depends on the record type as follows:

Record	Description	Attribute Name
GEOH	Geohydrologic units record	geoh_md
AQFR	Aquifers record	aqfr_md

6.10 Record Ready for Web

(LGWBFQ/C871,C872 - CHAR X(1) -- geoh_web_cd or aqfr_web_cd):

This field contains the status and availability of a record for display on the World-Wide-Web. ‘Y’ is the default. Only records flagged with a ‘Y’ are made available on the Web. The codes and their descriptions are:

Code	Description
Y	Yes-Record has been checked and is ready for Web display.
C	Conditional-Record has not been checked. No Web display.
P	Proprietary Record. No Web display.
L	Local use only. No Web display.

Record	Description	Attribute Name
GEOH	Geohydrologic units record	geoh_web_cd
AQFR	Aquifers record	aqfr_web_cd

6.11 Data Dependent On Record Type

(LGDATA - CHAR X(152)):

These fields are described below for each record type.

6.11.1 Geohydrologic Units Record -- LGTYP = GEOH

Sub-Section	Attribute Name	Description
6.11.1.1	lith_top_va	Depth to top of interval (C91)
6.11.1.2	lith_bottom_va	Depth to bottom of interval (C92)
6.11.1.3	lith_unit_cd	Unit identifier (C93) MANDATORY
6.11.1.4	lith_cd	Lithology code (C96)
6.11.1.5	contrib_unit_cd	Contributing unit (C304)
6.11.1.6	lith_ds	Lithologic modifier (C97)

The geohydrologic units data records are entered following the instructions in sections 6.1 through 6.10. Here is a brief review for your convenience:

Source agency code
 Site identification number
 Record type (GEOH)

Record sequence number
 Person creating record
 Date and time created
 Person updating record
 Date and time of last update
 Record ready for Web

The geohydrologic units data record is used to provide descriptive information about the geohydrologic units. The entry of geohydrologic data is identified by coding “GEOH” in geohydrologic type of record. Enter the GEOH components as follows:

6.11.1.1 Depth to Top of Interval
(LGTOP/C91 - CHAR X(8) -- lith_top_va):

Enter the depth to the top of this unit, in feet below land surface.

6.11.1.2 Depth to Bottom of Interval
(LGBOT/C92 - CHAR X(8) lith_bottom_va):

Enter the depth to the bottom of this unit, in feet below land surface. This field should be specified for all units except the last one in the hole.

6.11.1.3 Unit Identifier
(LGAQFR/C93 - MANDATORY SECONDARY-KEY CHAR X(8) -- lith_unit_cd):

Enter the eight-character code identifying the unit using codes given in the online file: /usr/opt/nwis/support/aageol.all.states (the terms BASEMENT and BEDROCK will be accepted as legal values.) The unit identifier is mandatory. The procedure for requesting an update to the unit identifier code reference list is available at: <http://water.usgs.gov/ogw/geoh-code-procedure.html>.

6.11.1.4 Lithology Code
(LGLITH/C96 - SECONDARY-KEY CHAR X(4) lith_cd):

Enter the code indicating the principal lithology of this unit. The codes are as follows:

Rock Term Abbreviation

Term	Abbreviation
Alluvium	ALVM
Anhydrite	ANDR
Anorthosite	ANRS
Arkose	ARKS
Basalt	BSLT
Bentonite	BNTN
Boulders	BLDR
Boulders and sand	BLSD

Term	Abbreviation
Boulders, silt, and clay	BLSC
Breccia	BRCC
Calcite	CLCT
Caliche (hard pan)	CLCH
Chalk	CHLK
Chert	CHRT
Clay	CLAY
Clay, some sand	CLSD
Claystone	CLSN
Coal	COAL
Cobbles	COBB
Cobbles and sand	COSD
Cobbles, silt, and clay	COSC
Colluvium	CLVM
Conglomerate	CGLM
Coquina	CQUN
Diabase	DIBS
Diorite	DORT
Dolomite	DLMT
Dolomite and shale	DMSH
Drift	DRFT
Evaporite	EVPR
Gabbro	GBBR
Glacial (undifferentiated)	GLCL
Gneiss	GNSS
Granite	GRNT
Granite, gneiss	GRGN
Gravel	GRVL
Gravel and clay	GRCL
Gravel, cemented	GRCM
Gravel, sand, and silt	GRDS
Gravel, silt and clay	GRSC
Graywacke	GRCK
Greenstone	GNST
Gypsum	GPSM
Hard pan	HRDP
Igneous (undifferentiated)	IGNS
Lignite	LGNT
Limestone	LMSN
Limestone and Dolomite	LMDM
Limestone and shale	LMSH
Loam	LOAM
Loess	LOSS
Marble	MRBL
Marl	MARL
Marlstone	MRLS
Metamorphic (undifferentiated)	MMPC
Muck	MUCK

Term	Abbreviation
Mud	MUD
Mudstone	MDSN
Other	OTHR
Outwash	OTSH
Overburden	OBDN
Peat	PEAT
Quartzite	QRTZ
Residium	RSDM
Rhyolite	RYLT
Rock	ROCK
Rubble	RBBL
Sand	SAND
Sand and clay	SDCL
Sand and gravel	SDGL
Sand and silt	SDST
Sand, gravel, and clay	SGVC
Sand, some clay	SNCL
Sandstone	SNDS
Sandstone and shale	SDSL
Saprolite	SPRL
Schist	SCST
Sedimentary (undifferentiated)	SDMN
Serpentine	SRPN
Shale	SHLE
Silt	SILT
Silt and clay	STCL
Siltstone and shale	SLSH
Siltstone	SLSN
Slate	SLTE
Soil	SOIL
Syenite	SYNT
Till	TILL
Travertine	TRVR
Tuff	TUFF
Volcanic (undifferentiated)	VLCC

6.11.1.5 Contributing Unit

(LGCONT/C304 - CHAR X(1) -- contrib_unit_cd):

Enter one of the following codes to indicate whether the unit is to be considered the principal aquifer. If this field is left blank, a rejection warning message will be generated during Edit and the field will be populated with the default of 'U'.

Code	Description
P	Principal contributing aquifer (only one per site)
S	Secondary contributing aquifer
N	Contributes no water
Q	Aggregate of lithologic units
U	Unknown contribution

**6.11.1.6 Lithologic Modifier
(LGDESC/C97 - CHAR X(123)-- lith_ds):**

Enter the adjective modifiers needed to describe the rock type. This field is free form-- there are no assigned codes. If abbreviations are necessary, 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

6.11.2 Aquifers Record -- LGTYP = AQFR

Sub-Section	Attribute Name	Description
6.11.2.1	aqfr_dt	Aquifer date (C95) MANDATORY
6.11.2.2	aqfr_static_lev_va	Aquifer static water level (C126)
6.11.2.3	aqfr_contrib_fc	Aquifer percent water contribution (C132)

The aquifer data records are entered following the instructions in sections 6.1 through 6.10. Here is a brief review for your convenience:

- Source agency code
- Site identification number
- Record type (AQFR)
- Sequence number of parent
- Record sequence number of child
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The aquifers record is a lower-level record within the geohydrologic units record. Data will not be stored in the aquifers record if any mandatory entry in the geohydrologic units record is missing. The aquifer record is used for entering hydrologic data about each unit

if such data are available. The entry of the aquifer data is identified by coding "AQFR" in geohydrologic type of record. Enter the AQFR components as follows:

6.11.2.1 Aquifer Date

(CNAQDT/C95 - MANDATORY CHAR X(8) -- aqfr_dt):

Enter the date on which the aquifer data were collected. If the month or day are not known, enter blanks in the spaces. Use leading zeros for month or day less than ten, and specify all four digits for the year. Date is a mandatory entry; hydrologic data for the unit will not be stored if this field is blank.

6.11.2.2 Static Water Level

(CNAQSL/C126 - CHAR X(7) -- aqfr_static_lev_va):

Enter the static water level in this 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 (-).

6.11.2.3 Percent Water Contributed

(CNAQCN/C132 - CHAR X(3) -- aqfr_contrib_fc):

Enter the percentage of the total yield of the well that is contributed by this 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 (-).

Section 7. Observation Well Heading File Components

(Ingres table name is GW_OBS_##)

Sub-Section	Attribute Name	Description
7.1	agency_cd	Source agency code (C4) MANDATORY
7.2	site_no	Site identification number (C1) MANDATORY
7.3	obs_seq_nu	Observation well heading seq.no. (C315) MANDATORY
7.4	obs_cn	Person creating record (C472)
7.5	obs_cr	Date and time created(C473)
7.6	obs_mn	Person updating record (C474)
7.7	obs_md	Date and time of last update (C707)
7.8	obs_web_cd	Record Ready for Web Flag (C873)
7.9	heading_line_tx	Observation well heading line (C270)

The OBSERVATION WELL HEADING record is used to specify headings for tabular water-level reports. Types of sites that have access to the OBSERVATION WELL HEADING record include lake (LK), spring (SP), stream (ST), ground-water (GW), subsurface (SB), land (LA), facilities (FA-), wetland (WE), and estuary (ES).

7.1 Source Agency Code

(HDAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

This is the agency that is the source of the site data. The Source Agency Code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. For a detailed description see [Section 1.1](#).

7.2 Site Identification Number

(HDSID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) site_no):

This is the 2 to 15-digit site identification (Site ID) number of the site to which the water-level data apply. If the site has not been entered into the Sitefile, this operation must be completed before the observation headings are input. The Site Identification Number is mandatory and a part of the primary key. For a detailed description see [Section 1.2](#).

7.3 Record Sequence Number

(HDSEQ/C315 - MANDATORY PRIMARY-KEY CHAR X(3) -- obs_seq_nu):

Enter the SEQUENCE NUMBER of each heading line. This number is mandatory and a part of the primary key.

7.4 Person Creating Record

(HDCUID/C472 - CHAR X(8) -- obs_cn):

This contains the user identification of the person creating the record. The user ID is entered automatically by the NWIS software.

7.5 Date and Time Created
(HDCRDT/C473 - CHAR X(14) -- obs_cr):

This contains the date and time the record was created. The date and time are entered automatically by the NWIS software.

7.6 Person Updating Record
(HDUID/C474 - CHAR X(8) -- obs_mn):

This contains the user identification of the person updating the record. The user ID is entered automatically by the NWIS software.

7.7 Date and Time of Last Update
(HDUPDT/C707 - CHAR X(8) -- obs_md):

This contains the date and time the record was last updated. The date and time are entered automatically by the NWIS software.

7.8 Record Ready for Web
(HDWBFG/C873 - CHAR X(1) -- obs_web_cd):

This field contains the status and availability of a record for display on the World-Wide-Web. ‘Y’ is the default. Only records flagged with a ‘Y’ are made available on the Web. The codes and their descriptions are:

Code	Description
Y	Yes - Record has been checked and is ready for Web display.
C	Conditional - Record has not been checked. No Web display.
P	Proprietary Record. No Web display.
L	Local use only. No Web display.

7.9 Observation Well Heading Line
(HDLINE/C270 - CHAR X(115) -- heading_line_tx):

For this field enter up to 115 characters of CHARACTER data. The data will not be edited except to remove leading, redundant internal, and trailing blanks. The data cannot exceed 115 characters per line, but more than one entry can be made per site (no limit on the number of entries).

Section 8. Hydraulics File Components

Sub-Section	Description
8.1	Source agency code (C4) MANDATORY
8.2	Site ID number (C1) MANDATORY
8.3	Record type (C744,C746) MANDATORY
8.4	Record sequence number or sequence number of parent (C790,C99) MANDATORY
8.5	Record sequence number of child (for COEF only) (C106) MANDATORY
8.6	Person creating record(C475,C478)
8.7	Date and time created (C476, C479)
8.8	Person updating record (C477, C480)
8.9	Date and time of last update (C745,C747)
8.10	Record ready for Web flag (C874,C875)
8.11	Data dependent on record types

The HYDRAULICS record is used to store components that relate to the hydraulics of the aquifer. Two types of hydraulics data are included, each identified by a component record type. Types of sites that have access to the HYDRAULICS record include glacier (GL), ocean (OC), lake (LK), spring (SP), ground-water (GW), subsurface (SB), land (LA), facilities (FA-), wetland (WE), and estuary (ES). The following is a list of the component codes used in the HYDRAULICS data file.

Record Type	Description of Contents	Data Table Name
HYDR	Includes the aquifer and test interval	gw_hydr_##
COEF	Includes the aquifer coefficients for the specified HYDR record	gw_coef_##

The related HYDRAULICS records have two record types and form a parent/child relationship. HYDR is the parent record to related COEF child records; the HYDR record must be established before any COEF records can be entered. The HYDR/COEF records are coded as follows:

8.1 Source Agency Code

(HYAGY/C4 - MANDATORY PRIMARY-KEY CHAR X(5) -- agency_cd):

This is the agency that is the source of the site data. The Source Agency Code is mandatory and a part of the primary key. Data for a site will not be stored if this field is blank. For a detailed description see [Section 1.1](#).

8.2 Site Identification Number

(HYID/C1 - MANDATORY PRIMARY-KEY CHAR X(15) -- site_no):

This is the 2 to 15-digit site identification (Site ID) number of the site to which the water-level data apply. If the site has not been entered into the Sitefile, this operation must be

completed before the hydraulics data are input. The Site Identification Number is mandatory and a part of the primary key. For a detailed description see [Section 1.2](#).

8.3 Record Type

(HYTYP/C744,C746 - MANDATORY SECONDARY-KEY CHAR X(4)):

The RECORD TYPE identifies the category of data included in the record. There are two categories with the HYDRAULIC data. This field is mandatory and is a secondary key. The categories are as follows:

Record Type	Description
HYDR	Hydraulic unit record (C744)
COEF	Coefficients record (C746)

8.4 Record Sequence Number or Sequence Number of Parent

HYSEQ/C790,C99 - MANDATORY PRIMARY-KEY CHAR X(3) -- hydr_seq_nu):

This is a number assigned at the time of data entry to keep data by category in logical order. This number is mandatory and a part of the primary key. The component number for the record sequence number depends on the record type as follows:

Record	Description	Attribute Name
HYDR	Hydraulic Unit Record (C790)	hydr_seq_no
COEF	Coefficients Record (C99)	hydr_seq_no

8.5 Record Sequence Number of Child (for COEF only)

(HYCSEQ/C106 - MANDATORY PRIMARY-KEY CHAR X(3) -- coef_seq_nu):

Each coefficient record for a site must have a unique identifying number in this space. The numbers need not be in sequence, but each can be used only once for that site. The entry number is mandatory; if this field is blank, coefficient data will not be stored. This field relates each coefficient record to the correct parent HYDRAULICS record, and the sequence number entered in this field must match the sequence number entered (hydr_seq_nu) in the related HYDR record.

8.6 Person Creating Record

(HYCUID/C475,C478 - CHAR X(8) -- hydr_cn or coef_cn)

This field contains the user identification of the person creating the record. The user ID is entered automatically by the NWIS software.

Record	Description	Attribute Name
HYDR	Hydraulic Unit Record (C475)	hydr_cn
COEF	Coefficients Record (C478)	coef_cn

8.7 Date and Time Created
(HYCRDT/C476,C479 - CHAR X(14) -- hydr_cr or coef_cr)

This field is the date and time the record was created. The date and time are entered automatically by the NWIS software.

Record	Description	Attribute Name
HYDR	Hydraulic Unit Record (C476)	hydr_cr
COEF	Coefficients Record (C479)	coef_cr

8.8 Person Updating Record
(HYUID/C477, C480 - CHAR X(8) -- hydr_mn or coef_mn)

This contains the user identification of the person updating the record. Entry of the user ID is made by the NWIS software automatically.

Record	Description	Attribute Name
HYDR	Hydraulic Unit Record (C477)	hydr_mn
COEF	Coefficients Record (C480)	coef_mn

8.9 Date and Time of Last Update
(HYUPDT/C745,C747 - CHAR X(14) -- hydr_md or coef_md):

This contains the date/time the record was last updated. Entry of this date is made by the NWIS software automatically. The component number for the date of the last update depends on the record type as follows:

Record	Description	Attribute Name
HYDR	Hydraulic Unit Record (C745)	hydr_md
COEF	Coefficients Record (C747)	coef_md

8.10 Record Ready for Web Flag
(HYWBF/C874,C875 - CHAR X(1) -- hydr_web_cd or coef_web_cd)

This field contains the status and availability of a record for display on the World-Wide-Web. ‘Y’ is the default. Only records flagged with a ‘Y’ are made available on the Web. The codes and their descriptions are:

Code	Description
Y	Yes - Record has been checked and is ready for Web display.
C	Conditional - Record has not been checked. No Web display.
P	Proprietary Record. No Web display.
L	Local use only. No Web display.

Record	Description	Attribute Name
HYDR	Hydraulic Unit Record (C874)	hydr_web_cd
COEF	Coefficients Record (C875)	coef_web_cd

8.11 Data Dependent On Record Type (HYDATA - CHAR X(82)):

These fields are described below for each record type.

8.11.1 Hydraulic Records -- HYTYP = HYDR

Sub-Section	Attribute Name	Description
8.11.1.1	hydr_unit_cd	Hydraulic unit ID (C100) MANDATORY
8.11.1.2	hydr_top_va	Depth to top of interval (C101)
8.11.1.3	hydr_bottom_va	Depth to bottom of interval (C102)
8.11.1.4	hydr_unit_tp	Hydraulic unit type (C103) MANDATORY
8.11.1.5	hydr_remark_tx	Hydraulic remarks (C104)
8.11.1.6	hydr_src_cd	Hydraulic source agency (C305)

The hydraulic data records are entered following the instructions in sections 8.1 through 8.10. Here is a brief review for your convenience:

- Source agency code
- Site identification number
- HYDR
- Record sequence number
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web flag

The hydraulic data record 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. The entry of hydraulic test interval data is identified by coding "HYDR" in hydraulics type of record. The HYDR components are entered as follows:

8.11.1.1 Hydraulic Unit

(HYHYUN/C100 - MANDATORY SECONDARY-KEY CHAR X(8) -- hydr_unit_cd):

Enter the eight-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.

8.11.1.2 Depth to Top of Interval

(HYHTOP/C101 - CHAR X(7) -- hydr_top_va):

Enter the depth to the top of the tested interval, in feet below land surface.

8.11.1.3 Depth to Bottom of Interval

(HYHBOT/C102 - CHAR X(7) -- hydr_bottom_va):

Enter the depth to the bottom of the tested interval, in feet below land surface.

8.11.1.4 Hydraulic Unit Type

(HYHTYP/C103 - MANDATORY CHAR X(1) -- hydr_unit_tp):

Enter the code indicating the hydraulic character of the unit tested. The codes and their descriptions are:

Code	Description
A	Aquifer
C	Confining layer

This entry is mandatory; hydraulic data will not be entered if this value is not specified.

8.11.1.5 Hydraulic Remarks

(HYHRMK/C104 - CHAR X(40) -- hydr_remark_tx):

Briefly describe the means by which the formation hydraulics data were determined. Forty characters are allowed. Use meaningful abbreviations. Examples:

- “Distance-drawdown, 3 wells”
- ”Specific-capacity test”
- ”Recovery, straight-line solution”

**8.11.1.6 Hydraulic Source Agency
(HYHSAG/C305 - CHAR X(5) i-- hydr_src_cd):**

Enter the agency code of the organization that collected the hydraulic data.

8.11.2 Coefficients Record -- HYTYP = COEF

Sub-Section	Attribute Name	Description	Maximum # of Decimal places allowed on input	Field Length
8.11.2.1	transmissivity_va	Transmissivity (C107)	3	7
8.11.2.2	horiz_conduct_va	Horizontal conductivity (C108)	5	12
8.11.2.3	vert_conduct_va	Vertical conductivity (C109)	5	12
8.11.2.4	storage_coef_va	Storage coefficient (C110)	7	8
8.11.2.5	leakance_va	Leakance (C111)	4	9
8.11.2.6	diffusivity_va	Diffusivity (C112)	0	13
8.11.2.7	spfc_storage_va	Specific storage (C113)	9	10
8.11.2.8	barom_effic_va	Barometric efficiency (C271)	0	3
8.11.2.9	porosity_va	Porosity (C306)	3	4

The coefficients data records are entered following the instructions in sections 8.1 through 8.10. Here is a brief review for your convenience:

- Source agency code
- Site identification number
- COEF
- Record sequence number
- Record sequence number of child
- Person creating record
- Date and time created
- Person updating record
- Date and time of last update
- Record ready for Web

The coefficients record is used to record the hydraulic coefficients determined by the test data. This record is a lower-level record within the HYDRAULIC record.

The entry of coefficients data is identified by the coding of “COEF” in component HYTYP of the record. Definitions of the COEF components in the following sections are from Geological Survey Water-Supply Paper 1988, "Definitions of Selected Ground-Water Terms--Revisions and Conceptual Refinements" (Lohman and others, 1974). Enter the COEF components as follows:

8.11.2.1 Transmissivity (T)
(HYCTRN/C107 - CHAR X(7) -- transmissivity_va):

Transmissivity is the rate at which water of the prevailing kinematic viscosity is transmitted through the unit width of the geohydrologic unit under a unit hydraulic gradient. Enter the computed transmissivity (T) in feet squared per day.

8.11.2.2 Horizontal Hydraulic Conductivity (KH)
(HYCHHY/C108 - CHAR X(12) -- horiz_conduct_va):

The hydraulic conductivity of the medium is the volume of water at the existing kinematic viscosity that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow. Enter the computed horizontal hydraulic conductivity (K) in feet per day.

8.11.2.3 Vertical Hydraulic Conductivity (KV)
(HYCVHY/C109 - CHAR X(12) -- vert_conduct_va):

Enter the computed vertical hydraulic conductivity (K) in feet per day.

8.11.2.4 Storage Coefficient (S)
(HYCSTR/C110 - CHAR X(8) -- storage_coef_va):

The storage coefficient is the volume of water a geohydrologic unit releases from or takes into storage per unit surface area of the geohydrologic unit per unit change in head. In an unconfined water body the storage coefficient is virtually equal to the *specific yield*. Enter the computed storage coefficient (Sy), dimensionless.

8.11.2.5 Leakance
(HYCLKC/C111 - CHAR X(9) -- leakance_va):

The leakance is the vertical hydraulic conductivity of the geohydrologic unit divided by the thickness of the unit. Leakance is the inverse of the coefficient of leakage (Hantush, 1964). Enter the computed leakance in one/day.

8.11.2.6 Hydraulic Diffusivity
(HYCDIF/C112 - CHAR X(13) -- diffusivity_va):

The hydraulic diffusivity is the parameter Transmissivity/Storage coefficient (T/S). Enter the computed hydraulic diffusivity (T/S, in feet squared per day).

8.11.2.7 Specific Storage (Ss)
(HYCSPS/C113 - CHAR X(10) -- spfc_storage_va):

The specific storage is the storage coefficient divided by the thickness of the geohydrologic unit. It is the volume of water the geohydrologic unit releases per unit volume per unit change in head. Enter the computed specific storage, dimensionless.

8.11.2.8 Barometric Efficiency
(HYCBRE/C271 - CHAR X(3) -- barom_effic_va):

The barometric efficiency of an aquifer is the ratio of water-level change to atmospheric-pressure change (Todd, 1980, p. 235-236). While it is theoretically possible for the barometric efficiency of an aquifer to range from 0% - 100%, barometric efficiency typically ranges from 20% to 75%. A warning will be displayed if the entered value is outside the typical range, but will be allowed if it is within the theoretical range. Enter the efficiency of the aquifer's response to barometric changes, in percent.

8.11.2.9 Porosity
(HYCPOR/C306 - CHAR X(4) -- porosity_va):

The porosity of the geohydrologic unit is its property of containing interstices or voids and may be expressed quantitatively as the ratio of the volume of its interstices to its total volume. At most, three digits are allowed. Enter the porosity as a decimal fraction; include the decimal point.

3 GROUND-WATER SITE-INVENTORY MENUS

by Leslie W. Lenfest, Jr.

There are two primary menus used to access GWSI programs, the GWSI Main Menu and GWSI System Menu. Most of the nationally supported GWSI programs used by the majority of users are accessed through the GWSI Main Menu. System Administrators or GWSI Database Administrators use the GWSI System Menu to perform database maintenance; the menu and the utilities on the menu are explained in the [NWIS Ground-Water Site-Inventory System Menu documentation](#). Both menus provide access to submenus, which contain additional GWSI functionality that is used less often than the primary functions. Common to all GWSI Menus are codes 98 and 99, which provide menu navigation and exit functions. If the user is attached to a directory that contains *usr/opt/nwis* in the pathname when the GWSI Main Menu is invoked, the directory will be changed to the origin directory. A UNIX command or user abbreviation may be executed from any GWSI menu. Virtually any command may be used, but if the command closes the unit on which the GWSI menu was active, control cannot be returned to the menu.

The GWSI Main Menu allows access to utilities that prepare data for entry into the GWSI database, provides for editing of the data for accuracy, updating the local database, and retrieving data from the local database. The data are presented in tabular and graphical formats. The GWSI Main Menu structure contains the Main Menu and three submenus: Utilities Submenu, Documentation Submenu, and Local Submenu. The Utilities Submenu, in turn, contains two additional submenus that can be used to verify and correct data in the database.

3.1 GWSI Main Menu

The [GWSI Main Menu](#) contains the following functions:

- Prepare data for entry into the database (Query Entry and Screen Entry)
- Validate data and prepare for updating database (Interactive Edit and Batch Edit)
- Update database (Interactive Update, Batch Update, Sitefile Only Update)
- Access and display data (Retrieval/Table, Hydrographs)
- Provide data support (Utilities Submenu)
- Access user documentation (Documentation submenu)

```

*****
*   Main Menu for WRD GWSI Database # 01   --  NWIS
*****
Code  Program Description                Code  Program Description
-----
 1 : Query Entry                        11 : Generate Field Forms
 2 : Screen Entry                       12 : QW Enter
 3 : Edit GW Data (from 1-2)           13 : Edit GW Data in Batch
 4 : Update GW Data (from 3)           14 : Update GW Data in Batch
 5 : Update Sitefile Only (runs 2,3,4)
 6 : Retrieval/Tables                  16 : Plot Hydrographs
 7 : Copy File (from 1-2) to Directory
10 : Change GW/QW Database #           91 : Utilities Menu
                                       93 : Check Sites-Make Edit Files Menu
 92 : Database Check Menu              97 : Local Menu
 96 : Documentation Menu               99 : Exit to UNIX
 98 : Exit to Previous Menu

Enter UNIX Command or Select Program Code:

```

Note: Users with read-only access will not see the Update programs indicated by codes 4, 5, and 14 on the Main Menu.

3.1.1 Option 1: Query Entry

This program displays a sequence of prompts to the user for entry of all or selected GWSI data components. The entered data are output into a file with a defaulted or user-designated name for use by the Edit software. Additional information about entering data into GWSI using the query entry option is available in [Chapter 4](#). Information about the fields that can be entered into GWSI is available in [Chapter 2](#) of this document.

3.1.2 Option 2: Screen Entry

This program displays screens on the monitor with data grouped in categories (site, construction, etc.) for entry of GWSI data components. The entered data are output into a file with a defaulted or user-designated name for use by the Edit software. Additional information about entering data into GWSI using the screen entry option is available in [Chapter 5](#). Information about the fields that can be entered into GWSI is available in [Chapter 2](#) of this document.

3.1.3 Option 3: Edit GW Data/Option 13: Edit GW Data in Batch

These programs use the files generated in either option 1 or 2 above to provide a second level of data verification and to create transaction files used by the UPDATE software to transfer the data to the Ingres database. In both processes, a ‘batch’ ID is entered after the input file name is identified; this ID is used by UPDATE to identify the data set that is to be transferred to the Ingres database. The difference between the two options is that

Option 3 is interactive with the user, Option 13 defers processing to a background process. Additional information about using this program is available in [Chapter 6](#).

3.1.4 Option 4: Update GW Data/Option 14: Update GW Data in Batch

These programs use the transaction files generated during the Edit step to further validate the data and load the data into the Ingres database. Both processes prompt the user for the 'batch' ID entered from the Edit step to identify the data set that is to be transferred to Ingres. The difference between the two options is that Option 4 is interactive with the user. Option 14 defers processing to a background process. Additional information about using this program is available in [Chapter 7](#).

3.1.5 Option 5: Update Sitefile Only

This program combines Options 2, 3, and 4 into one process. Only Sitefile data can be loaded with this option.

3.1.6 Option 6: Retrieval/Tables

This program provides access to data entered into the database and displays it in several different formats. Data selection is facilitated by gross and detailed selection criteria. Data may be output in table format or in files that may be used for further processing of the data. More detailed information about how to run this program is available in [Chapter 8](#).

3.1.7 Option 7: Copy File (from 1-2) to Directory watin

This program copies files from the user's current directory to a common repository directory, /usr/opt/nwis/data/watin. The UPDATE process may be restricted to certain users; files are copied to watin because it is the common repository for database update files.

3.1.8 Option 10: Change GW/QW Database Number

This program allows the user to change the database number for either or both the Ground-Water database and the Water-Quality database.

3.1.9 Option 11: Generate Field Forms

This program generates a custom form for use in the field. Any of the GWSI data components may be selected for display on the form, and the form may be blank or populated with current data available for the selected sites. More detailed information about this program is available in [Chapter 10](#).

3.1.10 Option 12: QW Entry

This option will start the QWDATA subsystem of NWIS. Water-quality data can be entered through this link from GWSI. Only users with DBA access or QWDATA write access will see this option in the GWSI menu and be able to open QWDATA from GWSI. Details about using QWDATA are included in the [QWDATA User Documentation](#).

Note: When QWDATA is opened from within GWSI, you should be aware of what QWDATA database is opened. You should review the message at the top of the screen when option 12 is selected:

YOU ARE USING WATER-QUALITY DATABASE NUMBER 01.

When you access QWDATA from within the GWSI program, the database opened is the same as the database number you were using within the GWSI program -- it is not the database number saved from the last session with QWDATA directly. If you need to change the database within QWDATA, you will need to change it before entering any data. The last time you directly accessed QWDATA, the database you were using was saved when exiting that session of QWDATA. When you exit from QWDATA within GWSI, the QWDATA database will be reset to the database used when exiting the last session of QWDATA directly.

3.1.11 Option 16: Plot Hydrographs

This program provides a graphical representation of water-level data for selected sites either to the monitor screen or to a printer. More detailed information about this program is available in [Chapter 9](#).

3.1.12 Option 91: The Utilities Submenu

- Code 1 - translates a station name into agency and site identification (Site ID) number. Detailed information for this option is available in [Chapter 11](#).
- Code 2 – inventories, changes, or deletes stations. Detailed information about the station change program is available in [Chapter 12](#).
- Code 3 - accesses support files (parameter code dictionary, geologic unit code file, FIPS code file, and state/county code file, etc.) Detailed information for the support files menu is available in [Chapter 13](#).
- Code 4 - accesses the Data Dictionary (either a short or a long list).
- Code 5 - lists records for one or more sites, as specified by the user.
- Code 10 - changes a user's default database number when multiple databases are used at a site and the user has access rights to more than one database. Detailed information for this option is available in [Chapter 14](#).

```

* Utilities Menu for WRD GWSI Database # 01  --  NWIS
*****
Code  Program Description
----  -
```

```

1 : Translate Station Name Into Agency and Site ID
2 : Station Change: Inventory, Change or Delete
3 : Query Support Files
4 : Data Dictionary List
5 : List Site Records
10 : Change GW/QW Database #
92 : Database Check Menu          93 : Check Sites-Make Edit Files Menu
98 : Exit to Previous Menu       99 : Exit to UNIXEnter UNIX Command
or Select Program Code:
    
```

3.1.13 Option 92: Database Checking Menu

- Code 1 – Check Sitefile/GWSI Data. Detailed information for this option is available in [Chapter 9 of the GWSI DBA Manual](#).
- Code 2 – Find GW Orphaned Records. Detailed information for this option is available in [Chapter 8 of the GWSI DBA Manual](#)
- Code 6 – Get Database Record Statistics. Detailed information for this option is available in [Chapter 14 of the GWSI DBA Manual](#).
- Code 10 - Change GW/QW Database #. Detailed information for this option is available in [Chapter 11 of the GWSI DBA Manual](#)
- Code 11 - Generate Report from Code 1. Detailed information for this option is available in [Chapter 10 of the GWSI DBA Manual](#).

```

*****
* Utilities Menu for WRD GWSI Data Base # 01 -- NWIS
*****

Code  Program Description          Code  Program Description
----  -
  1 : Translate Station Name Into Agency and Site ID
  2 : Station Change: Inventory, Change, or Delete
  3 : Query Support Files
  4 : Data Dictionary List
  5 : List Site Records
 10 : Change GW/QW Database #

 92 : Database Check Menu          93 : Check Sites-Make Edit Files Menu
 96 : Documentation Menu          97 : Local Menu

 98 : Exit to Previous Menu       99 : Exit to UNIX

Enter UNIX Command or Select Program Code:
    
```

3.1.14 Option 93: Check Sites_Make Edit Files Menu

The Check Sites_Make Edit Files menu is described in detail in [Chapter 12 of the GWSI DBA Manual](#). Please refer to that section for details about this menu.

3.1.15 Option 96: Documentation Submenu

The Documentation Submenu (code 96) launches the default web browser and the user is automatically taken to the GWSI User Documentation at the following location:

file:/usr/opt/nwis/util/gwdocs.html

The NWIS 4.8 documents are stored in PDF files, which require the Adobe Acrobat Reader to view and print.

3.1.16 Option 97: Local Menu

The local menu is available for WSC-specified options.

This is intended to be a user-modifiable script and can be found at */usr/opt/nwis/util/gwlocal*.

Please contact NWIS if you need assistance modifying this script with WSC-specified options.

```

*****
* Local Menu for WRD GWSI Database # 01 -- NWIS [version no.+yyyymmdd]
*****
Code  Program Description          Code  Program Description
----  -
 1 : Local Option 1
 2 : Local Option 2
 3 : Local Option 3
 4 : Local Option 4
 5 : Local Option 5
 6 : Local Option 6
 7 : Local Option 7
 8 : Local Option 8
 9 : Local Option 9
10 : Change GW/QW Database #

80 : Local Menu 1                81 : Local Menu 2

98 : Exit to Previous Menu      99 : Exit to UNIX

Enter UNIX Command or Select Program Code:

```

4 QUERY ENTRY PROGRAM

by Wendy McPherson

The Query Entry (gwinput) program is an interactive program that can be used to create the transaction or data file to store data in GWSI. Screen Entry ([hdrinp - Section 5](#)) is an alternate method for data entry to GWSI.

4.1 Introduction

Query Entry is designed to be used with a user-defined prompt list file and is useful for repetitive data entry such as water levels. The user creates a file that prompts for only those fields the user specifies in the prompt list file. The prompt list file takes only minutes to create ([directions are described in section 4.3.1.1](#)) and the prompt list file can be saved and used again. The prompt list file can also be used with Screen Entry. If the user chooses not to use a prompt list file in Query Entry, only components in the Sitefile table are available for addition or modification.

Entering new data or modifying existing data on the screen does not directly update the GWSI System. The transaction data file generated from the entry programs is stored in the directory where GWSI was started, unless a pathname was specified.

The transaction data file must be processed using the GWSI error-checking routines ([Section 6](#)) prior to updating the database. All users should use the Edit program (*Code 3-Edit*) to check for errors. If no errors were found and the user has write privileges to GWSI (*Code 4--Update appears as an option on the GWSI Main Menu*), the file needs to be processed through the Update program.

If the user does not have write privileges to GWSI (*Option 4--Update does **not** appear as an option on the GWSI Main Menu*), the file may need to be copied to the Watin directory (*Option 9*) for processing by the Database Administrator (DBA). The procedure for writing data to GWSI varies by District.

4.2 Editing Commands

The following characters have special meaning when used in column one of most input fields:

?	Optns	Display Valid Options	\$	S. Fld	Reset Current Field
>	N. Fld	Next Field	<	L. Fld	Previous Field
%	Repnt	Repaint Screen or use (Ctrl L)	&	In:Ed	Toggle between Input and Edit Mode
!	Abort	Abort the Current Screen or Program-- If ! does not abort the session, type (Ctrl P) to break out of the session.			

The following characters have special meaning when used anywhere in an input field:

space	Space-bar	Advance One Character	<BS>	Back-space	Back Up One Character
*	End	Blank to End of Field and Continue	#	Blank	Blank Current Character
_	Ins. C	Insert a Character	\	Del. C	Delete a Character
"	No. Ctrl	Enter the Next Typed Character	^	Ys. Ctrl	Execute the Next Typed Character

Many of the original EMACS commands function within the GWSI input programs, but these commands may not function the same as commands in more current versions of EMACS. [Section 5](#) contains a list of the EMACS commands that function with GWSI.

4.3 Program Operation

Query Entry can be used with or without a prompt list file. A prompt list file is a user-defined file that specifies which fields the cursor will move to (or prompt the user for) when entering data using GWSI input programs. Query Entry (gwinput) is most efficient when used with a prompt list file.

When entering dates in GWSI fields, GWSI will automatically change invalid early years, such as '0003', to the corresponding year of the current millennium, such as '2003'. Although the screen will refresh to show such a change in Screen Entry, it will not refresh to show the change in Query Entry. However, the user can verify that the year was modified by examining the GWSI batch file after exiting the entry session.

If after selecting Query Entry (*Option 1*) the following message appears:

******* YOU MUST SET YOUR WINDOW ABOVE THIS LINE BEFORE PROCEEDING! *******

Drag the bottom of the session window to above this line or the text that follows will be misaligned. This message moves upward with the window. Use Ctrl L to refresh the screen and the prompt will again be at the bottom of the screen.

4.3.1 Using a Prompt List File

Instructions are provided for creating a prompt list file ([4.3.1.1](#)) and using an existing prompt list file ([4.3.1.2](#)).

4.3.1.1 Creating a Prompt List File

To create a prompt list file, reply with a **Y** (yes) to the following question:

Do You Want to Use a Prompt List? Y ***

When assigning the prompt list file name it is helpful to use a name that describes its function. The prompt list file cannot be edited easily with a text editor. If some of the data record fields need to be changed, it is easiest to recreate the prompt list file or use Screen Entry (hdrinp).

Select Prompt List File Name to Use or Create**(A): watlev.prompt_____*****

Enter the name of the new prompt list file that will be created.

******* File Does Not Exist *********Do You Want to Try Another One? N** (to create a new prompt list file)**Do You Want to Create a New List? Y** (the prompt list file was named watlev.prompt in this case)

Next, select which fields are to be included in the prompt list file.

Example:**Do You want to prompt for General Site Data (Y,N,A,Q):****Y = Yes, N = No, A = Add, Q = Quit**

Y is the default and if acceptable, press enter. If, for example, there is General Site Data to be entered and **Y** is selected, the program will give the opportunity to select the specific fields within this section such as site name and project number. If **N** is selected, the entire section is skipped.

The prompt list file is complete when there are no more fields to include in the prompt list file. GWSI will begin creating the transaction file, which begins with the agency code, by prompting the user for the fields from the prompt list. An <enter> skips a non-mandatory field or repeating group with no change to the data. A '?' will give an explanation of the options for that field when available. The GWSI editing commands listed at the beginning of the Query Entry session and the original EMACS command ([see Section 5](#)) can also be used. For example, the less than sign can be used to go back one or more fields.

After the user is prompted for the last data record field, data can be added or changed for any field, not just the fields in the prompt list file, by selecting the internal GWSI number at the following:

Edit Which Item (0 = Store)? 0__

The internal GWSI numbers are shown on the screen near the field. The number is unique to the screen and does not correspond to the numbers on the GWSI coding form

(Form No. 9-1904-A). For example: the District field is 3 on the GWSI screen and C6 on the GWSI coding form.

After the data has been entered for a site, the user can return to the GWSI Main Menu or enter data for the next site.

Another Site? (Y or N):

N (no) = GWSI Main Menu

Y (yes) = Agency code for the next site

If there are no more sites to be entered, or the user wants to close the file, after selecting N the user will be asked for a transaction data file name to hold the data.

Select Card Output File Name (A): d.wsmcpher.017_____

The default file name consists of d.userID.xxx, where xxx is a sequential number that forms a unique output file name. The transaction data file must be processed using the GWSI error-checking routines prior to updating the database.

WARNING: It is best to include mandatory and conditionally mandatory fields when creating prompt list files.

1) Mandatory fields do not need to be included in the prompt list file, but if these fields are not included and there are no default values to auto-populate these fields, error messages will occur when running the file through the Edit program and prevent the data from being entered into GWSI. As a precaution, the mandatory fields should be included in the prompt list file so data for those fields can be correctly entered.

2) If mandatory fields are not included when default values are available, the default values will be assigned to those mandatory fields by the program. This can be problematic with data like water levels. If the conditionally mandatory field, water-level accuracy, is not included in the prompt list, the program will automatically assign a value to water-level accuracy based on the value entered for water level. If a mistake is made when entering the water level, for example 10.21 is entered when the value should be 10.2, the program will assign an accuracy of 2 based on the incorrect water-level entry. If the user edits the incorrect water-level value by selecting the internal GWSI number **(Edit Which Item (0 = Store)? 0)**, *the water-level accuracy code will not be updated to 1* unless the water-level accuracy field is chosen.

4.3.1.2 Using an Existing Prompt List File

Select Query Entry *Option 1*). To use an existing prompt list file, input the file name. If the prompt list file is not in the directory where GWSI was started, the full pathname will need to be typed.

Do You Want to Use a Prompt List? Y ***

Select Prompt List File Name (A): watlev.prompt (prompt list file)

Select Card Output File Name (A): d.wsmcpher.020 (data file)

GWSI prompts for the fields specified in the prompt list.

An <enter> skips a non-mandatory field or repeating group with no change to the data.

After the data has been entered for a site, the user can return to the GWSI Main Menu or enter data for the next site.

Another Site? (Y or N):

N (no) = GWSI Main Menu

Y (yes) = Agency code for the next site

4.3.2 Using Query Entry without a Prompt List File

After selecting Query Entry (Option 1), respond with an **N** to the following question and the user will be asked for each data record type.

Do You Want to Use a Prompt List? N

Consider using Screen Entry ([Section 5](#)) if there are many different data record types to be input for only a few sites.

5 SCREEN ENTRY PROGRAM

by John Atwood, revised by Wendy McPherson

The Screen Entry (hdrinp) program is an interactive data entry and editing program used to generate the transaction or data input file needed to store data in GWSI. If the data to be entered or modified for a site are repetitive or are limited to only a few data record types, such as water levels, the user can consider using Query Entry ([gwinp - Section 4](#)).

5.1 Introduction

Screen Entry (hdrinp) uses a separate screen for each data record and only displays the data record screen selected. All fields within the data record are displayed on the screen. If there are no data to be entered for that field, or no changes to be made, the field can be skipped by pressing <Enter>. If data need to be modified for a field, the editing commands ([see section 5.2](#)) can be used. Mandatory or required fields cannot be skipped.

Entering new data or modifying existing data on the screen does not directly update the GWSI database. The transaction or data input file generated from the entry programs is stored in the directory where the GWSI program was started, unless a different pathname was specified.

The transaction file must be processed using the GWSI error-checking routines ([Section 6](#)) prior to updating the database. All users should use the Edit program (*Option 3--Edit*) to check for errors. If no errors were found and the user has write privileges to GWSI (*Menu Option 4--Update appears as an option on the GWSI Main Menu*), the file needs to be processed through the Update program.

If the user does not have write privileges to GWSI (*Option 4--Update does not appear as an option on the GWSI Main Menu*), the file may need to be copied to the Watin directory ([Option 7](#)) for processing by the Database Administrator (DBA). The procedure for writing data to GWSI varies by WSC.

5.2 Editing Commands

Field-editing control codes function in both GWSI data entry programs: Query and Screen Entry (hdrinp). For Screen Entry (hdrinp), the commands appear on two lines at the bottom of the screen.

Optns S.Fld N.Fld L.Fld Reprt In:Ed Abort End Blank Ins.C Del.C No.Ctrl Ys.Ctrl
? \$ > < % & ! * # _ \ " ^

These two lines are used to display error messages, warnings, and special prompts. If a detectable error is made, an error message is displayed on the bottom line and a continuation prompt is displayed on the line above the error message. Special messages

and prompts are displayed in the same manner. When the special message or prompt is no longer needed, the control code list is restored.

The following characters have special meaning when used in column one of most input fields:

?	Optns	Display Valid Options	\$	S. Fld	Reset Current Field
>	N. Fld	Next Field	<	L. Fld	Previous Field
%	Repnt	Repaint Screen or use (Ctrl L)	&	In:Ed	Toggle between Input and Edit Mode
!	Abort	Abort the Current Screen or Program-- If ! does not abort the session, type (Ctrl P) to break out of the session.			

The following characters have special meaning when used anywhere in an input field:

space	Space-bar	Advance One Character	<BS>	Back-space	Back Up One Character
*	End	Blank to End of Field and Continue	#	Blank	Blank Current Character
_	Ins. C	Insert a Character	\	Del. C	Delete a Character
"	No. Ctrl	Enter the Next Typed Character	^	Ys. Ctrl	Execute the Next Typed Character

Many of the original EMACS commands are also accepted as control, but these commands may not function the same as commands in more current versions of EMACS. In the list below, <Ctrl> means that the control key is pressed simultaneously with the specified character. <Esc> means that the Escape key is pressed before the specified character or characters. Where applicable, the non-EMACS equivalent has been given.

EMACS Command	Function	Non-EMACS equivalent command
<Ctrl>A	Positions the cursor to the beginning of the field.	B
<Ctrl>B	Positions the cursor backward one character.	<BS>
<Ctrl>C	Re-executes the most recent command.	
<Ctrl>D	Deletes the character under the cursor.	
<Ctrl>E	Positions the cursor to the end of the field.	E
<Ctrl>F	Positions the cursor forward one character.	<right arrow>
<Ctrl>G	Cancels a multiple character command that has been started.	
<Ctrl>H	Does not delete a character as it does in EMACS, but instead positions the cursor backward one character.	<BS> backspace
<Ctrl>I	Positions the cursor to the next subfield.	<Tab>
<Ctrl>K	Kills or clears the field.	<Delete>
<Ctrl>L	Refreshes the screen.	%
<Ctrl>M	Positions the cursor to the next field.	Enter or carriage return <CR>
<Ctrl>N	Positions the cursor to the next field.	>
<Ctrl>O	Opens the line and inserts one character.	_

EMACS Command	Function	Non-EMACS equivalent command
<Ctrl>P	Breaks to UNIX.	<Break>
<Ctrl>Q	Inserts the next character as data.	" (Ignored on most terminals)
<Ctrl>R	Positions the cursor to the previous field.	<
<Ctrl>S	Positions the cursor to the next field.	> (X-OFF on most terminals should not be used)
<Ctrl>V	Skips to mandatory fields. After all the mandatory fields are input, toggles between input and edit mode.	&
<Ctrl>W	Kills or clears the field after moving the field contents to the kill buffer.	
<Ctrl>X	Used as a prefix to other commands, which are listed below.	
<Ctrl>Y	Replaces the field with the contents of the kill buffer.	
<Ctrl>Z	Positions the cursor to the previous field.	<
<Ctrl>-	Lists any valid values for field.	? (Ignored on most terminals)
<Ctrl>X<Ctrl>C	Aborts the screen.	!
<Ctrl>X<Ctrl>G	Ignores the <Ctrl>X prefix.	
<Ctrl>X<Ctrl>H	Kills or clears the field left of the cursor.	
<Ctrl>X<Ctrl>I	Inserts one blank character.	_
<Ctrl>X<Ctrl>K	Kills or clears the field left of the cursor.	
<Ctrl>X<Ctrl>L	Converts entire field to lowercase characters.	
<Ctrl>X<Ctrl>S	Toggles between input and edit mode.	& (X-OFF on most terminals should not be used.)
<Ctrl>X<Ctrl>U	Converts entire field to uppercase characters.	
<Ctrl>X<Ctrl>W	Toggles between input and edit mode.	&
<Ctrl>X<Ctrl>Z	Used as a prefix to other commands, which are listed below.	
<Ctrl>XQ	Inserts the next character as data.	"
<Ctrl>XR	Refreshes the screen.	%
<Ctrl>XS	Toggles between input and edit mode.	&
<Ctrl>XV	Positions the cursor to the previous field.	<
<Ctrl>X[	Positions the cursor to the previous field.	<
<Ctrl>X]	Positions the cursor to the next field.	>
<Ctrl>X<Ctrl>Z<Ctrl>A	Positions the cursor to the previous field.	<
<Ctrl>X<Ctrl>Z<Ctrl>E	Positions the cursor to the next field.	>
<Ctrl>X<Ctrl>Z<Ctrl>G	Ignores the <Ctrl>X<Ctrl>Z prefix.	
<Ctrl>X<Ctrl>Z<Ctrl>H	Kills or clears the field left of the cursor.	
<Ctrl>X<Ctrl>Z<Ctrl>K	Kills or clears the field right of the cursor. The character in the position of the cursor is also deleted.	
<Ctrl>X<Ctrl>Z<Ctrl>Y	Replaces the field with the contents of the kill buffer.	
<Esc><Ctrl>D	Kills or clears the field right of the cursor. The character in the position of the cursor is also deleted.	
<Esc><Ctrl>G	Ignores the <Esc> prefix.	
<Esc><Ctrl>O	Opens the line and inserts one character.	_
<Esc><Ctrl>V	Positions the cursor to the next field.	>

EMACS Command	Function	Non-EMACS equivalent command
<Esc><Ctrl>Y	Replaces the field with the contents of the kill buffer.	
<Esc><Space>	Deletes a character.	\
<Esc><	Positions the cursor to the previous field.	<
<Esc>>	Toggles between input and edit mode.	&
<Esc>?	Lists any valid values for field.	?
<Esc>@	Terminates the field at the cursor position.	*
<Esc>A	Positions the cursor to the previous field.	<
<Esc>B	Positions the cursor to the previous subfield.	
<Esc>D	Kills or clears the field.	<Delete>
<Esc>E	Positions the cursor to the next field.	>
<Esc>F	Positions the cursor to the next subfield.	<Tab>
<Esc>G	Toggles between input and edit mode.	&
<Esc>K	Kills or clears the field right of the cursor. The character in the position of the cursor is also deleted.	
<Esc>L	Converts entire field to lowercase characters.	
<Esc>M	Positions the cursor to the first nonblank character.	F
<Esc>N	Positions the cursor to the next field.	>
<Esc>P	Positions the cursor to the previous field.	<
<Esc>R	Positions the cursor to the previous field.	<
<Esc>S	Positions the cursor to the next field.	>
<Esc>U	Converts entire field to uppercase characters.	
<Esc>V	Positions the cursor to the previous field.	<
<Esc>W	Copies or writes field into kill buffer.	
<Esc>Y	Replaces (yanks) the field with the contents of the kill buffer.	
<Esc>~	Unmodifies the field.	\$
<Esc><Delete>	Kills or clears the field.	<Delete>
<Delete>	Does not delete a character as it does in EMACS, but kills or clears the field.	<Delete>

5.3 Program Operation

Screen Entry can be used with or without a prompt list file. A prompt list file is a user-defined file that specifies which fields the cursor will move to (or prompt the user for) when entering data using GWSI input programs.

If after selecting Screen Entry (*Option 2*) the two-line description of control codes do not appear on the screen, lengthen the window by dragging the bottom of the window down. Use Ctrl L to refresh the screen. If the two-line description of control codes still does not appear, repeat the process until they do.

The user needs to specify whether a prompt list file will be used. Instructions for creating and using a prompt list file are in [section 5.3.9](#). The following instructions assume the user is not using a prompt list file.

Do You Want to Use a Prompt List? N

5.3.1 Transaction File Name Selection

Next, the transaction or data file name needs to be assigned.

Select Card Output File Name (A): d.userid.xxx_____

A default transaction file name is provided and consists of d.userid.xxx, where xxx is a sequential number that forms a unique output file name. If this file name is not modified, it will be the name of the file used to store the transaction data. The file will be stored in the directory where the GWSI program was started, unless a pathname is specified. If the file exists, the program asks if the file is to be overwritten. If **Y**, the old file is deleted and a new one is created in its place. If **N**, the new data are appended to the end of the existing file. The **(A)** specifies that the field is alphanumeric.

5.3.2 Site ID Selection

The Site ID Selection screen prompts for the Agency Code and Site ID of the station to be modified or added. GWSI will check the database to determine if the site already exists based on these two fields. The Site ID is expected to contain a 7-15 digit number. A 15-digit ID is checked for proper latitude and longitude values and warns if an invalid number is found. No additional checking is done on a number less than 15 digits. If the site was found, the program displays the Station Name. If the site was not found, the “New Site” message appears in screen 1:

Screen 1:	***** Make Site Selection *****
Agency Code USGS	Site ID 391122076554401
Station Name	***** New Site *****
Are these Items Correct?	

If an error was made when typing the Site ID, the user can respond with **N** to: **”Are these Items Correct?”** and the cursor will return to the Site ID field and the correct value can be reentered. If the prompt is answered with a **Y** or an <Enter>, a search is made for the specified ID and control is passed to screen 2.

If the user does not know the site ID, or prefers not to type out the 15 numbers, the user can skip the site ID field and enter a partial or full station name. GWSI will search the database and will display the possible matches until the user selects a site.

5.3.3 General Site Data

The General Site Data Record applies to all sites and has no special record selection screen; it is displayed automatically in Screen Entry (hdrinp) when a nonexistent site is selected or when option 3 (General Site Data) is selected. Options 4 through 10 correspond to the ground-water data records ([section 5.3.4.1](#)).

The cursor will move to each field (unless using a prompt list file) and mandatory fields must be completed. Press <Enter> to skip non-mandatory fields or if there is no data or changes to the existing data. A ‘?’ will provide an explanation of the options for that field when available.

Screen 2:

***** General Site Data *****

Agency Code USGS	Site ID 7777777777777777	Project No. 1= _____
Station Name 2=	District 4=30	Country 5=US
Site Type 3=	State 6=30	County 7=
	Latitude 8=	Longitude 9=
Latitude/Longitude:	Accuracy 10=	Method 11=
Altitude 13=	Accuracy 14=	Datum 12=
Land Net 17=		Datum 16=
Hydrologic Unit Code 19=		Topographic Setting 18=
Standard Time Zone Code 21=MST	(-07:00)	Drainage Basin Code 20=
Map Name 23=	Map Scale 24=	Daylight Savings Time Flag 22=Y
National Water Use Code 26=	Data Type 27=	Agency Use 25=
Instruments 28=	1234567890ABCDEF	
Remarks 30=	27890ABCDEF	Date Inventoried 29= - -
		Web Flag 31=C

Optns	S.Fld	N.Fld	L.Fld	Repnt	In:Ed	Abort	End	Blank	Ins.C	Del.C	No.Ctrl	Ys.Ctrl
?	\$	>	<	%	&	!	*	#	_	\	"	^

Data can be added or changed for any field by selecting the internal GWSI number for that field. The internal numbers are shown on the screen near the field. The number is unique to the screen and does not correspond to the numbers on the GWSI coding form (Form No. 9-1904-A). For example, the internal GWSI number for District field is three on the GWSI screen and C6 on the GWSI coding form.

If no changes are to be made, after entering the general site data for a new site, the program options screen ([section 5.3.4.1](#)) will appear. Remember that when data entry has been completed, the transaction file will need to be processed using the GWSI Edit and Update programs.

5.3.4 Data Entry Screens

There are three types of entry screens:

1. Program Options
2. Record Selection
3. Record Data Entry

5.3.4.1 Program Option Screens

The Program Option screen consists of a list of program options and a single prompt to select the desired option. The list of program options depends on the type of site being entered. See [section 1.9](#) for site-type dependencies. The form below is shown as an example:

```
1  Exit HDRINP Program
2  Select New Site
3  General Site Data Record
   (SITE)
4  Construction Data Records
   (CONS,LIFT,REPR,MPNT)
5  Miscellaneous Data Records
   (OWNER,OCNT,OTID,OTDT,VIST,QUAL,QVAL,NETW,COOP,RMKS)
6  Discharge Data Record
   (DISC)
7  Geohydrologic Data Records
   (GEOH,AQFR)
8  Hydraulic Data Records
   (HYDR,COEF)
9  Water-Level Data Record
   (LEV)
10 Observation Data Record
    (OBS)

Select Record Type (I or A): _____
```

The desired option may be selected by typing in the integer (I) number on the left side menu, or the three to four alpha (A) character record types shown in parentheses. For example, if the user wants to add or update Miscellaneous Data records, the number “5” should be typed; if the user wants to update the MPNT record “MPNT” may be entered at the prompt, rather than select “4” for the Construction Record and then select MPNT at the prompt for record type.

Below is a list of the program options and functions:

Exit HDRINP Program - Closes the data transaction file and terminates execution of the Screen Entry (hdrinp) program.

Select New Site - Used to select a different site to add or modify. Once a site is selected, all data transactions will refer to that site until the site ID is again changed using this option.

5.3.4.2 Record Selection Screens

The Record Selection screen consists of data record descriptors used to identify the unique data record. The screen prompts for the key information required to identify both the data type and the specific entry where multiple entries are permitted. For example, first select option 4 for construction data records, then specifying “OPEN” for opening as the record type. Record types are identified in [section 5.3.4.3](#).

```

Agency Code USGS                               Site ID
391234076543201
Record Type OPEN                               Record Sequence
Number
>>>>"NEXT"=No More Construction Records

Record Type:          CONS = Construction          HOLE = Hole
CSNG = Casing         OPEN = Openings             LIFT = Lift
REPR = Repairs       SPNG = Springs              MPNT =
Measuring Point
    
```

5.3.4.3 Record Data Entry Screens

The Record Data Entry screens may consist of multiple data descriptors and entry fields. The Record Data Entry screen has many forms, each one corresponding to one of the data record types.

Menu Code	Record Type	Screen Entry (hdrinp) Option
3	General Site Data Record	SITE
4	Construction Data Record	
	Construction Data	CONS
	Hole Data	HOLE
	Casing Data	CSNG
	Openings Data	OPEN
	Lift Data	LIFT
	Repairs Data	REPR
	Spring Data	SPNG
	Measuring-Point Data	MPNT

Menu Code	Record Type	Screen Entry (hdrinp) Option
5	Miscellaneous Data Record Owner Data Owner Contact Data Other-ID Data Other Data Site-Visit Data Water-Quality Data Water-Quality Value Data Geophysical Logs Data Network Data Special-Cases Data Miscellaneous-Values Data Cooperator Data Remarks	OWNR OCNT OTID OTDT VIST QUAL QVAL LOGS NETW SPEC MSVL COOP RMKS
6	Discharge Data Record	DISC
7	Geohydrologic Data Record Geohydrologic Units Data Aquifer Data	GEOH AQFR
8	Hydraulic Data Record Hydraulic Data Coefficients Data	HYDR COEF
9	Water-Level Data Record	LEV
10	Observation Data Record	OBS

5.3.5 Required Fields

Many of the screens have mandatory or required fields that must be completed before the GWSI program will allow the data to be stored. If an existing record is modified and a required field is found to be missing, the program forces the user to supply the required data before the data can be stored.

5.3.6 Error-Checking

The GWSI program checks for errors using the same criteria as the Edit and Update programs. Full error-checking is done as the data are entered. Several different types of tests are performed. In numeric fields, non-valid characters are rejected immediately upon input. Other values are checked for valid choices where a list of valid codes is available. Dates are checked for nonexistent days (February 30), or dates after the current date. Latitude and longitude values are also checked for validity.

Where a list of valid codes is available, the codes can be listed by inputting a ‘?’ in column one of the appropriate field, or by entering a ‘?’ while in the temporary control mode. Temporary control mode is when the user types a ‘^’ to specify that the next character is to be (temporarily) used for control; normal mode returns when the character

has been entered. If an error is detected, an error message is displayed at the bottom of the screen.

There are two types of errors: warnings and fatal errors.

Error messages that begin and end with five dashes (-----) are **WARNINGS** only. Error messages that begin and end with five asterisks (*****) are **FATAL ERRORS** and the associated data is rejected either immediately, or after an unchanged conflicting value.

Note: See the following section for information regarding error checks and default data.

5.3.7 Default Data

In some cases, such as District code, defaults are provided or are set up by the DBA. These defaults are displayed in the data field, and may be used by pressing <Enter> without modifying the data field, or the default values can be modified.

One special default occurs on the site header record. If the site has a 15-digit site identifier, the latitude and longitude values default to the values reflected in the site identifier.

When mandatory fields are programmed to recognize a default value, such as C32 (Web-ready flag) and C304 (Contributing unit), it may appear to the user that he or she can delete the value without generating an error message during Query or Screen entry. The user may note, additionally, that during [Edit \(GWSI Main Menu option 3\)](#) and [Update \(GWSI Main Menu option 4\)](#) no expected error messages are generated. This behavior is because the software checks for defaults before it checks for errors. If the software notices that a field should have a default value but is blank, it repopulates that field; then it checks for errors. Consequently, the apparently “blinking” of the default value is corrected before any error messages can be generated. A retrieval will show that the fields are populated with the default values.

Users may, of course, replace the default values with other values. These other values will be retained in the database and will not be reset by the software. The “resetting” of default values occurs only when the applicable field is found to be blank.

5.3.8 Data Field Justification

Character and integer fields are left-justified; however, some integer fields such as the sequence numbers are actually right-justified first, and the leading blanks are replaced with "0". Floating point numbers are right-justified.

5.3.9 Using Prompt List Files

Prompt list files can be used with Screen Entry (GWSI release 4.1). A prompt list file is a user-defined file that specifies which fields the cursor will move to (or prompt the user for) when doing data entry in the GWSI input programs. Prompt list files take only minutes to create and can be used again. Specifying only those fields needed saves time

since the <Enter> key does not need to be pressed to skip the fields where there is no data. The prompt list file can also be used with [Query Entry \(Section 4\)](#).

```
Do You Want to Use a Prompt List? Y
Select Prompt List to Use or Create (A): watlev.prompt
```

Type the name of the prompt list file to be used or created. It is helpful to assign a name that describes the function of the prompt list file. For example: watlev.prompt for water levels.

5.3.9.1 Using an Existing Prompt List File

If the prompt list file already exists, specify the prompt list file name. The GWSI program will then ask for a filename to store the data, and continue with the data entry screens. The Menu Codes for the Data Records will still need to be selected, then the prompt list file will move the cursor to the fields selected in the prompt list file.

5.3.9.2 Creating a Prompt List File

To create a prompt list file, select a prompt list file name. The error message ******* File Does Not Exist ******* will appear at the bottom of the screen because the file does not yet exist.

Do You Want to Try Another One? N

Type **N** (no) to create a prompt list file. Type **Y** (yes) if the filename was mistyped.

Do You Really Want to Create a New List? Y

The GWSI program will then ask for which fields to include in the prompt list file.

Example:

Do You want to prompt for General Site Data (Y,N,A,Q):

Y = Yes, **N** = No, **A** = Add, **Q** = Quit

Y (yes) is the default and if this field is to be always included in the prompt list file, press <enter>. If, for example, there is General Site Data to be entered and **Y** is selected, the program will give the opportunity to select the specific fields within this section, such as Site Name and Project Number. If **N** is selected, the entire section is skipped. The **A** (Add) is used when the user only wants to be prompted for the field when adding a new site (not when modifying an existing site).

The prompt list file is complete when there are no more fields to include in the prompt list file. GWSI will begin creating the data input file and will ask for a file name to store the data:

Select Card Output File Name (A): d.wsmcpher.044_____

The default file name consists of d.userID.xxx (sequential number).

The cursor will move to the fields selected in the prompt list file, although all fields appear on the screen and mandatory fields must be completed. Press <enter> to skip non-mandatory fields or if there is no data or changes to the existing data. For an explanation of the available options for that field, type a '?'.

Data can be added or changed for any field, (not just the fields specified in the prompt list file), by typing the internal GWSI number for that field at the following:

Edit Which Item (0 = Store)? 0___

The internal numbers are shown on the screen near the field. The number is unique to the screen and does not correspond to the numbers on the GWSI coding form. For example District field is 3 on the GWSI screen and C6 on the GWSI coding form.

5.4 Transaction Data Output File

The Screen Entry (hdrinp) program writes the data to a formatted sequential access (flat) file. This file is a temporary file that contains all of the information for performing the specified transactions. The format of a transaction file record is very similar to the old GWSI card image format. After the Screen Entry program is executed, the output file can be modified externally with an editor before processing through the update program. If an editor is used, however, special care must be taken to prevent errors in the modified data. Additionally, the editor selected must not be one that inserts hidden control characters in the file. The particular errors to watch out for include: illegal item numbers, illegal characters in numeric fields, missing field terminators, and records which have been extended past the proper record length (80 characters).

When a new site or data record is added, all defined fields are written to the output file. All required fields must be defined before the data can be output to the transaction file.

If a record is being modified, only the descriptor fields and those fields that have actually been modified are written to the transaction file. If a required field is encountered that has not been defined, such as in a record that has been input to the system by some other program, that data field must be defined before any further modification is permitted.

6 EDIT PROGRAM

by Colleen A. Babcock

The Ground-Water Site-Inventory Edit program performs edit validation and logical data checks and prepares the transaction files used in the Ground-Water Update program (Chapter 7) to update the database.

6.1 Introduction

The Edit program performs edit validation and logical data checks on the output files created using the Screen Entry program or the Query Entry program. Edit checks are performed using the GWSI Expanded Edit feature and include: code validation against reference lists, reasonable value checks, proper date fields, and proper numeric values. Data passing edit checks are reformatted into transaction files accepted by the Update procedure.

6.2 Program Operation

The Edit program may be selected from the GWSI Main Menu by selecting Option 3 for interactive processing or Option 13 for batch processing. Interactive processing is recommended for small amounts of data; the batch option has been provided for medium to large amounts of data. It is not uncommon for large files to take up to an hour to run on some systems.

The program will identify itself, display the database number to which the user is currently assigned, and ask for the input file name. This is the name of the output file created by Screen Entry or Query Entry. The program will then ask for a batch code, which can be a single character 0-9 or A-Z. The batch code is used to identify the transaction files created by Edit and passed as input to the Update routines. If the database number does not reflect the database the user wants to access, change the number by using Option 10 (Change GW/QW Database #) on the GWSI Main Menu.

6.3 Files Used by the Ground-Water Edit Program

The input file for the Edit program is the output file generated from Screen or Query Entry programs. This program can use a file name or full pathname. Several temporary files are also created by the Edit procedure and follow the naming convention `edit.file.date.time`; these files are automatically deleted upon successful completion of the procedure. If `editgw` abnormally terminates for any reason, these files need to be deleted. The `editgw` program creates several output files, created in the directory from which the program was run. For easy identification, all output file names are concatenated with the batch code entered when the program first started.

Listed below are the output file names and a description of each file. **Note: "xx" indicates the database number (leading zeros included) and "a" indicates the batch code entered when the program was first initiated.**

File Name	Description
site.tran.dbxx.a	Contains Sitefile transaction records that successfully pass the edit routines.
gw.cons.tran.dbxx.a	Contains Construction transaction records that successfully pass the edit routines.
gw.misc.tran.dbxx.a	Contains Miscellaneous transaction records that successfully pass the edit routines.
gw.disc.tran.dbxx.a	Contains Discharge transaction records that successfully pass the edit routines.
gw.hydr.tran.dbxx.a	Contains Hydraulics transaction records that successfully pass the edit routines.
gw.geoh.tran.dbxx.a	Contains Geohydrologic transaction records that successfully pass the edit routines.
gw.lev.tran.dbxx.a	Contains Water-Level transaction records that successfully pass the edit routines.
gw.obs.tran.dbxx.a	Contains Observation well heading transaction records that successfully pass the edit routines.
errfile.dbxx.a	Listing of fatal and warning messages indicated by the edit routines.

6.4 Error Checks

The Edit program performs the following functions:

1. Performs logical checks of the data:
 - Dates:
 - ✓ Compares all dates with the 'Date Well Constructed' (C21) to make sure the entered date is after C21
 - ✓ Future dates are not allowed
 - ✓ Dates prior to January 01, 1900 are not allowed
 - Performs logical checks between similar data types; e.g. Depth of Well (C28) cannot be deeper than Depth of Hole (C27)
 - Validates data using reference lists. Many of the GWSI components have associated reference lists that limit what can be entered. Data validation

for these components check to make sure that the data satisfy ONE of the following conditions:

- ✓ data are within a list of values
 - ✓ data are within a range of values
 - ✓ data conform to a specific format
2. Verifies that a record with the same Site ID does not exist before one is added.
 3. Verifies that a record does exist before a modify or delete transaction is attempted.
 4. Verifies that a record exists in the Sitefile before adding other record types associated with that site.
 5. Verifies that parent records exist before adding lower-level records.

Checks are performed on all date fields to prevent future dates and dates prior to the date of construction of the site. All depth fields are checked against the depth of the hole. No depths deeper than the hole depth are allowed.

6.5 Running Edit

The Edit program is initiated from the GWSI Main Menu by selecting Option 3 for interactive operation or Option 13 for batch Edit. The program will run with or without errors detected.

6.5.1 Edit Run Without Detecting Errors

If the input data file was prepared using Screen or Query Entry, there is little likelihood of Edit finding and reporting errors. Below is an example of a typical run of Option 3 where no errors are detected; user responses are underlined:

```

*****
* Main Menu for WRD GWSI Database # 01 -- NWIS-4_4_1-4
*****

Code  Program Description          Code  Program Description
-----  -----
 1 : Query Entry                    11 : Generate Field Forms
 2 : Screen Entry                   12 : QW Entry
 3 : Edit GW Data (from 1-2)        13 : Edit GW Data in Batch
 4 : Update GW Data (from 3)        14 : Update GW Data in Batch
 5 : Update Sitefile Only (runs 2,3,4) 16 : Plot Hydrographs
 6 : Retrieval/Tables
 7 : Copy File (from 1-2) to Directory watin

10 : Change GW/QW Database #

92 : Database Check Menu           91 : Utilities Menu
96 : Documentation Menu            93 : List Utilities Menu
                                   97 : Local Menu

98 : Exit to Previous Menu         99 : Exit to UNIX

Enter UNIX Command or Select Program Code: 3

Your current GW database is number 01

***** Loading Edit Tables *****

***** Please Wait *****

NWIS EDIT PROGRAM
RELEASE VERSION NWIS_4_0+20010511

DATABASE NUMBER:      1

INPUT FILE NAME IS d.joeuser.006
ENTER BATCH ID, VALID OPTIONS ARE 0-9, A-Z a

Deleting existing Batch files

Processing data - please be patient

NO ERRORS REPORTED

Press <Enter> for Menu or Enter UNIX Command:

```

Ground-Water Edit Run Without Detected Errors

Note that in the above example, the displayed text indicates “**NO ERRORS REPORTED.**” This means that the Edit program found no errors, and no file containing errors was generated.

If Edit ran without reported errors, the user can proceed to the Update step (Option 4). See documentation on the Update step in [Section 7](#).

6.5.2 Edit Run with Errors Detected

Sometimes, the Edit program does find errors in the input file. This usually occurs if the input file is prepared using a text editor, or an input file prepared by Screen or Query Entry has been modified and errors are introduced. When errors are detected, the text, rather than report “NO ERRORS REPORTED”, will conclude with “END OF INPUT FILE--CHECK errfile.dbxx.n”:

```

NWIS EDIT PROGRAM
RELEASE VERSION NWIS-4_4_0-20040329

DATABASE NUMBER:      1

INPUT FILE NAME IS d.joeuser.007
ENTER BATCH ID, VALID OPTIONS ARE 0-9, A-Z 1

Deleting existing Batch files

Processing data - please be patient

END OF INPUT FILE--CHECK errfile.db01.1

Press <Enter> for Menu or Enter UNIX Command:
    
```

This file will be created in the directory the user was in at the time Edit was run; it needs to be reviewed, the errors corrected in the input file, and Edit re-run to generate the transaction files and to make sure the errors have been fixed as explained in Section 6.6.

6.6 Error Correction

Errors indicated in errfile.dbxx.a should be identified and corrected in the input file. The format of errfile.dbxx.a includes two lines of output for each error, as described below:

First Line:	
Column	Description
1-5	Line number of first line of repeating group where error occurred
6-80	First line of repeating group where error occurred, includes Agency Code, Site ID, and first few components of the record
Second Line:	
Column	Description
1-9	Error message number
6-80	Description of the error

An example of an input file that contains several errors (bold and underlined) is shown below.

```

XXXXX
USGS 474251114385217 R=0* T=A* 5=4656-002000*
USGS 474251114385217 12='New Site near Spart, Mt                '*
USGS 474251114385217 6=30* 41=XX* 7=30* 8=000* 9= 474251* 10= 1143852* 11=S*
USGS 474251114385217 35=M* 36=NAD27* 16= 5000* 18= 1* 17=M* 22=NGVD29*
USGS 474251114385217 20=10010001* 711=20000101* 802=NNNNNNYNNNNNNNNNNNNNNNN*
USGS 474251114385217 804=ANNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN*
USGS 474251114385217 805=YNNYNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN* 806=None* 813=MST*
USGS 474251114385217 814=Y* 32=C* 3=C* 2=W* 21=20000101* 23=O* 24=U*
USGS 474251114385217 714=111SPBK * 27= 500* 28= 500*
USGS 474251114385217 R=58* T=A* 723#001* 60=19990101* 63=W E Digem* 64=S* 65=R*
USGS 474251114385217 66=S* 69=P* 70= 48* 850=Y*
USGS 474251114385217 R=146* T=A* 147#001* 148=18880101* 703=P* 150= 25.6*
USGS 474251114385217 151=9* 152=F* 153= 100* 154= 50* 156=S*
USGS 474251114385217 157= 48* 859=Y*
USGS 474251114385217 R=234* T=A* 235#20000101* 243=** 237= 23.65* 239=S* 276=2*
USGS 474251114385217 244=S* 247=UXGS* 858=Y*
    
```

Input File with Errors

The error file that results from running the example input file through Edit is shown below. This is followed with an analysis of the errors and how to fix them.

```

Error messages for input file d.llenfest.006

Line
No      First line of input for record being processed
1  USGS 474251114385217 R=0* T=A* 5=4656-002000*
*  4041 Country code (C041) Invalid Character Code--ERROR--RECORD REJECTED
1  USGS 474251114385217 R=0* T=A* 5=4656-002000*
*  4007 State code (C007) Invalid Character Code--ERROR--RECORD REJECTED
1  USGS 474251114385217 R=0* T=A* 5=4656-002000*
*  4020 Hydrologic unit code (C020) Invalid Character Code--ERROR--RECORD REJECTED
1  USGS 474251114385217 R=0* T=A* 5=4656-002000*
*  4714 Aquifer code (C714) Invalid Character Code--ERROR---VALUE ACCEPTED
1  USGS 474251114385217 R=0* T=A* 5=4656-002000*
*  94000 SITEFILE record failed Edit must be corrected before update--ERROR---VALUE
REJECTED
10 USGS 474251114385217 R=58* T=A* 723#001* 60=19990101* 63=W E Digem* 64=S* 65=R*
*  15060 Date of construction (C060) Date Precedes Date Constructed--ERROR---VALUE
ACCEPTED
12 USGS 474251114385217 R=146* T=A* 147#001* 148=18880101* 703=P* 150= 25.6*
*  1148 Date discharge measured (C148) Mandatory Field Missing--ERROR---VALUE REJECTED
15 USGS 474251114385217 R=234* T=A* 235#20000101* 243=** 237= 23.65* 239=S* 276=2*
*  77000 No = or # sign in component value pair--ERROR---VALUE REJECTED
15 USGS 474251114385217 R=234* T=A* 235#20000101* 243=** 237= 23.65* 239=S* 276=2*
*  31238 Water-level status (C238) Water Level or Status Required--ERROR---VALUE ACCEPTED
15 USGS 474251114385217 R=234* T=A* 235#20000101* 243=** 237= 23.65* 239=S* 276=2*
*  4247 Source Agency (C247) Invalid Character Code--ERROR--RECORD REJECTED
15 USGS 474251114385217 R=234* T=A* 235#20000101* 243=** 237= 23.65* 239=S* 276=2*
*  94000 GW.LEV record failed Edit must be corrected before update--ERROR---VALUE
REJECTED
    
```

Example of Contents of Error File

Analysis:

1. Country Code (41) was set to XX. It caused the errors in line 1 (first five errors) in the Error file. It should be corrected to 'US'.
 - a. XX is not in the list of acceptable entries for country..
 - b. States are related to Country; there are no related states to an invalid country, so the validation for the state code failed.
 - c. Hydrologic Unit Code (HUC) is related to State. There are no related HUCs for an invalid state, so the validation for the HUC failed.
 - d. Aquifer Code is related to state. There are no related Aquifer Codes for an invalid state, so the validation for the Aquifer Code failed.
 - e. For a new site, the site MUST exist in the Sitefile before any other related ground-water data can be entered. There are several 'fatal' errors in the Sitefile entry, so the entire record will be rejected until the errors are corrected.
2. Date of Construction (60) was set to 01/01/1999. It caused the error in line 10. The Date of Construction (60) should be later than the Sitefile Date Constructed (21). This is an example of an accepted error, where a warning is issued, but the value is accepted because it is not severe enough to be considered a fatal error. Because the warning was issued, the value should be reviewed and probably corrected to a date later than 01/01/2000. It will be accepted if no further action is taken.
3. Date of Discharge (148) was set to 01/01/1888. It caused the error on line 12. The Discharge Date must be later than the Sitefile Date Constructed and should be corrected to a date later than 01/01/2000.
4. There were a couple of problems in line 15:
 - a. The type of water level (C243) was set to '*'; it should be set to 'L'. This was rejected because it contains invalid syntax. The whole record was rejected because C243 is mandatory.
 - b. The Agency Code was set to 'UXGS' and should be set to 'USGS'. This error would also be a cause for the entire record being rejected.
 - c. There is an additional error shown that warns that "**Water-level status (C238) Water Level or Status Required.**" This was probably displayed as a result of the syntax error in C243 because the software has no way of knowing which type of water level to look for. There are rules about when Water Level or Status is required. In this example the Water Level was entered, therefore the error message would not normally be displayed for this condition.

It is important to note that none of these errors would have been allowed through either of the GWSI data input programs (Screen or Query Entry). The errors were intentionally made in the input file for illustrating the example, but could have been made accidentally if the file were created or modified with an editor.

Error descriptions in the second line of the error file are categorized in three ways:

- **ERROR—RECORD REJECTED** – The entire record that contains the erroneous values is rejected because the erroneous value has an error, such as a missing mandatory component.
- **ERROR—VALUE REJECTED** – The indicated component has an illegal value entered which constitutes a fatal error and will be rejected; the error may or may not cause the entire record to be rejected.
- **ERROR—VALUE ACCEPTED** – The indicated component has an illegal value that is not fatal and will be entered in the database. This error should be reviewed, even though it is allowed, to make sure the entered value is intentional.

All input file errors that were detected and displayed in the errfile must be reviewed. It is possible that erroneous values may cause Edit to tag some correct values with an error. The “**REJECTED**” values must be corrected before the value and/or its related record will be updated to the database through Ground-Water Update. Values that were tagged as errors, but “**ACCEPTED**”, should be corrected if the intended value was not entered. Cleaning up the input file may be an iterative process. Edit may need to be run several times until all of the “**REJECTED**” values have been eliminated.

Once the “**REJECTED**” errors have been eliminated and the user is satisfied the “**ACCEPTED**” values are correct, the user may proceed to the Update step, explained in [Section 7](#).

Error message numbers and descriptions are listed in [Section 15](#).

7 UPDATE PROGRAM

by Colleen A. Babcock

The Ground-Water Site-Inventory Update program is used to update the GWSI Sitefile and ground-water data tables from transaction files generated by the Edit program (Chapter 6).

7.1 Introduction

The Ground-Water Site-Inventory Update program is used to update the GWSI Sitefile and ground-water data tables. This procedure can only be run after successful completion of the Edit program.

7.2 Program Operation

The Update procedure adds, modifies, and deletes records for the Sitefile and ground-water data tables.

The Update procedure may be selected from the GWSI Main Menu using Option 4 for interactive processing and Option 14 for batch processing. Batch processing is recommended for medium to large amounts of data. The Update procedure must be run from the directory containing the output files from Edit.

The only interactive input required by the Update procedure is the batch code used in the Edit procedure. After inputting the batch code, the procedure then verifies that the transaction files exist and opens them. If there are no transaction files available, the procedure tells you and terminates processing. At this point, verify that the batch code was entered correctly and that you are attached to the appropriate directory. Run the procedure again with the correct batch code or in the correct directory if this caused Update to fail.

7.2.1 Update Files

Listed below are the input (transaction) and output (error) file names and a description of each file. ***Note: "xx" indicates the database number (leading zeros included) and "a" indicates the batch code entered when the program was first initiated. No attempt should be made to modify any of the transaction files with an editor; modification of these files is the most likely source of errors reported in the upt.err.dbxx.a error file and may result in serious damage to the database.***

File Name	Description
site.tran.dbxx.a	Contains Site File transaction records that successfully pass the editgw procedure.
gw.cons.tran.dbxx.a	Contains Construction transaction records that successfully pass the editgw procedure.
gw.misc.tran.dbxx.a	Contains Miscellaneous transaction records that successfully pass the editgw procedure.
gw.disc.tran.dbxx.a	Contains Discharge transaction records that successfully pass the editgw procedure.
gw.hydr.tran.dbxx.a	Contains Hydraulics transaction records that successfully pass the editgw procedure.
gw.geoh.tran.dbxx.a	Contains Geohydrologic transaction records that successfully pass the editgw procedure.
gw.lev.tran.dbxx.a	Contains Water-Level transaction records that successfully pass the editgw procedure.
gw.obs.tran.dbxx.a	Contains Observation well heading transaction records that successfully pass the editgw procedure.
gw.upterr.dbxx.a	Listing of fatal and warning messages indicated by the uptgw procedure. This is the only user output file for uptgw.

7.2.2 Error Checks

The Update program performs the same validation checks as the Edit Program, which includes the following functions:

- Performs logical checks of the data:
- Dates:
 - ✓ Compares all dates with the ‘Date Well Constructed’ (C21) to make sure the entered date is after C21.
 - ✓ Future dates are not allowed.
 - ✓ Dates prior to January 01, 1900 are not allowed.
- Performs logical checks between similar data types; e.g. Depth of Well (C28) cannot be deeper than Depth of Hole (C27).
- Validates data using reference lists. Many of the GWSI components have associated reference lists that limit what can be entered. Data validation for these components checks to make sure that the data satisfy ONE of the following conditions:

- ✓ data are within a list of values.
 - ✓ data are within a range of values.
 - ✓ data conform to a specific format.
- Verifies that a record with the same site ID does not exist before one is added.
 - Verifies that a record does exist before a modify or delete transaction is attempted.
 - Verifies that a record exists in the Sitefile before adding other record types associated with that site.
 - Verifies that parent records exist before adding lower-level records.

7.2.3 Normal Operation of Update

Normal operation of Update should only require initiation of Update from the GWSI Main Menu and the entry of the batch ID assigned at the Edit step. No error messages should be generated in upt.err.dbxx.a. The following is an example using Option 4 (Update GW Data), interactive processing of ground-water data.

```

*****
* Main Menu for WRD GWSI Database # 01 -- NWIS-4_4_1-4
*****

Code  Program Description          Code  Program Description
----  -
1 : Query Entry                    11 : Generate Field Forms
2 : Screen Entry
3 : Edit GW Data (from 1-2)        12 : QW Entry
4 : Update GW Data (from 3)        13 : Edit GW Data in Batch
5 : Update Sitefile Only (runs 2,3,4) 14 : Update GW Data in Batch
6 : Retrieval/Tables              16 : Plot Hydrographs
7 : Copy File (from 1-2) to Directory watin

10 : Change GW/QW Database #

92 : Database Check Menu          91 : Utilities Menu
96 : Documentation Menu           93 : List Utilities Menu
                                   97 : Local Menu

98 : Exit to Previous Menu        99 : Exit to UNIX

Enter UNIX Command or Select Program Code: 4

Your current GW database is number 01

***** Loading Edit Tables *****

***** Please Wait *****

```

```

NWIS UPDATE PROGRAM
VERSION NWIS-4_4_0-20040329

Database Number      1

ENTER BATCH CODE FROM EDIT ROUTINE a

Sitefile transactions will be processed
Construction file transactions will be processed
Discharge file transactions will be processed
Water level file transactions will be processed

Updates processing, please be patient

UPDATE PROCESSING COMPLETED--CHECK upt.err.db01.a
for ERROR MESSAGES and STATISTICS

NUMBER OF CONSTRUCTION RECORDS ADDED =      6
NUMBER OF DISCHARGE RECORDS ADDED =      1
NUMBER OF WATER LEVEL RECORDS ADDED =      2

Press <Enter> for Menu or Enter UNIX Command:

```

Ground-Water Update

After the Update process has completed, the `upt.err.dbxx.a` file should be reviewed to make sure that no errors occurred during the Update process. Since Update uses the same validation procedures that Edit uses, there should be no errors reported; an example of a normal `upt.err.dbxx.a` file is shown below.

```

Press <Enter> for Menu or Enter UNIX Command: more upt.err.db01.a
NUMBER OF SITES ADDED =      1
NUMBER OF CONSTRUCTION RECORDS ADDED =      6
NUMBER OF DISCHARGE RECORDS ADDED =      1
NUMBER OF WATER LEVEL RECORDS ADDED =      2

Press <Enter> for Menu or Enter UNIX Command:

```

Normal upt.err.dbxx.a File

7.2.4 Abnormal Operation of Update

If the `upt.err.db01.a` file does contain errors, there are two likely sources:

- Errors reported in the Edit error file were not corrected prior to running Update.
- Modifications were made to the transaction files listed in section 7.2.1 prior to running Update.

If the errors resulted from running Update without correcting errors in the Edit step, the user should go back to the input file used by Edit and resolve the problems. Once the problems have been fixed, re-run Edit and Update.

If the error messages resulted from errors introduced into the transaction files by modifying them, the best course of action is to either create a new input file using query or screen entry, or edit the existing input file with the desired updates and run Edit. Once an error-free Edit is completed, run the Update program to update the database.

If neither of these appears to be the source of the error messages, contact NWIS at headquarters.

8 GROUND-WATER RETRIEVAL/TABLING PROGRAM

by Gary D. Rogers and Richard R. Luckey, revised by Dorinda Gellenbeck

The Ground-Water Retrieval and Tabling program is a general-purpose retrieval and tabling program that accesses the Sitefile and all of the associated GWSI files.

8.1 Introduction

The Ground-Water Retrieval and Tabling program can be used to generate two types of general data tables, four types of water-level tables, or files suitable for input into other programs. This retrieval and tabling program allows the user to retrieve information from the USGS Sitefile and the associated Ground-Water Site-Inventory (GWSI). The first few times this program is used, ask for the detailed explanation (**V**erbose) to lead you through it. Later, you can select the minimum explanation (**T**erse) option to speed processing. When using this program with minimum explanations, further information can usually be obtained about program queries by entering a question mark (?) in response to a prompt.

The program requires the use of a number of temporary files. These are created in the current directory and are deleted when they are no longer needed. You must have sufficient space in the current directory to accommodate these files. If the program is interrupted, these files may remain, although they are usually deleted unless a severe problem has occurred.

8.2 Operation of retrieval software

From the main GWSI menu, select option 6 – Retrieval/Tables

8.2.1 Set-up Parameters

After you select the Retrieval/Tables option, the first query will ask you to identify your set-up parameters:

Enter set-up parameters (T/V,I/C/R,<CR>=TI):

Your answer to this query should be two letters to set how you want the retrieval program to operate. The default answer is TI. The first code will direct how the program presents queries throughout the operation of the retrieval program:

(T) Terse. Minimum explanation is provided. (default)

(V) Verbose. Detailed explanation is provided.

Specify **T** or **V** for the level of detail you require.

The second code will identify the type of input you will provide to the retrieval program:

(I) Interactive. You are prompted to provide all necessary data. (default)

(C) Control file. Required information is read from a control file created in a previous run of this program. You may override any option obtained from the control file. The control file (default name gw.ctrl) contains all of the program specifications and may be used to run a subsequent retrieval.

(R) Resume after phantom/batch. No file processing is required, but use this program to display/print output from the previously processed phantom/batch job.

For example, if you wish a detailed explanation and are processing interactively, enter **VI** or just **V**.

8.2.2 Root Path Name

After entering the setup parameters, you are prompted to enter a root path name:

Enter root path name (<CR>=gw):

The root path name is used to build default path names for the various files used and created during the retrieval. The default root name is **gw**, but you may enter a different root name. The program generates default path names by adding a suffix to the root name you specify. Whenever a new file is required in the program, you are prompted and given the choice of using the default path name or giving the file a different path name. For example, if completing a retrieval for the “Stillwater Project,” you might specify a root name of “Stillwater.” Pathnames beginning with Stillwater (e.g., Stillwater.ctrl, Stillwater.table) would be generated by the program if the default names are accepted.

Note: All files generated will be in the directory where you first started GWSI.

8.2.3 Gross Selection of Sites

The next query you will need to answer is to select a method to identify a gross selection of sites:

Which field do you wish to use for gross selection of sites (1-11,<CR>=1)? ?

You must choose one of the following sitefile fields to be used for gross selection of sites --

- (1) Agency with site ID (C4&C1)
- (2) Country-State-County (C41&C7&C8)
- (3) Primary Aquifer (C714)
- (4) Hydrologic Unit (C20)
- (5) Water Use (C24)
- (6) Project Number (C5)
- (7) Drainage Basin (C801)
- (8) Use of Site (C23)
- (9) Station Name (C12)
- (10) Latitude range (C9)
- (11) Longitude range (C10)

You will later be given an opportunity to further qualify your selection by specifying a latitude-longitude boundary and/or by specifying tests to be performed on any GWSI fields.

1. Agency with site ID ([Sections 1.1 and 1.2](#)): You can enter up to 1,000 values or ranges. There are four options available for this selection:
 - S** - Specify sites, one-by-one (may use partial site ID)
 - R** - Specify range of site IDs (or partial IDs)
 - G** - Specify range of site IDs based on "latitude" (columns 1-6) and "longitude" (columns 7-13) portions of the site ID
 - A** - Specify that all sites are to be retrieved.As an option, you may select this field and provide an external file (default name gw.sites) that contains the agency code (columns 1-5) and the site ID (columns 6-20) of the sites to be retrieved. The entire agency-site ID must be included. If including only a partial site ID, append an asterisk (*) to the partial ID. This list may be generated from the program by asking for creation of a list of selected sites when the [processing parameters \(section 8.2.7\)](#) are specified.
2. Country-state-county code ([Sections 1.11, 1.12, 1.13](#)): You can enter up to 1,000 values. It is not necessary to enter the entire country-state-county code for this option. You can enter just the country or country-state codes and a retrieval will process for the abbreviated codes entered.
3. Primary aquifer code ([Section 1.49](#)): You can enter up to 1,000 values. This is component C714 in the Sitefile and not component C93 in the geohydrologic file.
4. Hydrologic unit code number ([Section 1.27](#)): You can enter up to 1,000 values.
5. Water-use code ([Section 1.46](#)): You can enter up to 1,000 values.
6. Project number ([Section 1.7](#)): You can enter up to 1,000 values.
7. Drainage basin code ([Section 1.28](#)): You can enter up to 1,000 values.
8. Use-of-site code ([Section 1.43](#)): You can enter up to 1,000 values.
9. Station name (local well number) ([Section 1.8](#)): You can enter up to 1,000 values or partial values. As an option, select this field to provide an external file that contains the names (or partial names) of the sites to be retrieved (columns 1-24). If partial names are used, the retrieval may contain duplicate lines. This is the result of a single station name matching multiple pieces of the partial name search value.
10. Latitude ([Section 1.14](#)): You can enter up to 1,000 ranges.
11. Longitude ([Section 1.15](#)): You can enter up to 1,000 ranges.

Retrieval of any water-quality data is restricted by the data quality indicator code (DQI) that is stored with a result value. For more details about the DQI code, please refer to [Section 3.4.3.4](#) of the QWDATA User Documentation.

You will be given an opportunity later to further qualify or limit the number of sites that will be selected by the gross selection. Consistent data input and judicious use of the gross selection criteria can significantly reduce retrieval time. For example, if all sites have a properly coded project number and only sites for projects PROJ001 and PROJ008 are of interest, the size of the database is immediately reduced to include data for those two projects only.

Depending on your choice, the subsequent prompts will vary. Follow the prompts to complete your choice for the gross selection of sites.

8.2.4 Limitation for Site Selection

After completing the gross selection of site criteria, you will be required to answer a query about limiting your site selection:

```

*****GWSI Retrieval Restrictions Have Been Implemented.*****
*****Please review Option 7 below.*****

Current limitations to site selection –

(1) Polygon: Sites are not restricted by latitude-longitude polygon
(2) Detail tests: Sites are not restricted by detail testing
(3) Site types to be included: SP      ) Spring
                               GW*    ) Well
(4) Maximum number of sites to retrieve by gross select (0=no limit):    0
(5) Max no sites to pass polygon, detail & type tests (0=no limit):    0
(6) Maximum number of records to output for tabling (0=no limit):    0
(7) Retrieval restriction options: A) Exclude Sites/Data Not Available on Web

Enter item number to change, R to re-list items or <CR> to continue:

```

1. Latitude-longitude polygon boundary of a geographic area

The sites that pass the gross-selection criteria can be tested to see if they fall within a latitude-longitude polygon. The polygon is defined by up to 1000 latitude-longitude points. The points may begin on any vertex, but must be entered in a counter-clockwise order. The points may be entered from the terminal or from an existing file. The polygon file (default name gw.poly) defines the vertices of the latitude-longitude polygon. This may be an existing file or it may be created by the program. In addition, the program has the capability to generate a polygon approximating a circle of a given radius (miles) about a point. The points may be saved in a file for future use.

Note: Currently, the Polygon Retrieval function will not process latitude/longitude vertices entered with decimal seconds properly (e.g. 107 31 29.34), as might be generated by GIS. The software truncates the decimal part of seconds. When this occurs, duplicate latitude/longitude vertices may be created, which is not permitted, and may cause the Polygon Retrieval to fail.

After entering the polygon vertices, you are prompted whether or not any changes are needed to the selected polygon. The options are to **M** modify, **A** add, or **D** delete any one entry. A list of the vertices appears on the screen, and any vertex may be selected for the change. Only one vertex at a time may be changed. When the change has been made, the program prompts for the next change to the polygon. If no further changes are needed, enter an **N**; the program then continues to the next step.

2. Detail testing of values of most Sitefile or GWSI-related file fields

Do you wish to specify any detail testing (Y/N,<CR>=Y)?

Enter test field/test string:

Enter operator:

Enter test value:

Enter connector to next test (Or/And/While) or <CR> if none:

Up to 20 detailed tests to further restrict selection of sites may be specified. These tests are performed after a site has passed the gross selection criteria and has passed the polygon criteria. A record included in the gross site selection and polygon tests failing the detailed tests will not be included in the output. Any field in the Sitefile or any of the associated GWSI files may be selected for detail testing. Components used for detail testing need not be included in the output. A test consists of a component number, an operator, and a value. Available operators are:

EQ Equals	NE Not Equal
GT Greater than	LT Less than
GE Greater than or Equal to	LE Less than or Equal to
IN In range of	EX Outside range - for character strings only--
CN Contains	NC Does not contain

Test values are numbers, character strings, or components. Tests of character strings will search the entire length of the character string (maximum 20 characters). If trailing spaces are required, enclose the test value in single quotes ('). To use a component as a test value, enclose the component number in parentheses. For example, to test for water levels greater than well depth, use C237 GT (C28). To test data fields, enter the test value (date) in the form: yyyyymmdd. To test for missing fields, use -- for the test value. The only operators applicable to missing fields are **EQ** or **NE**.

An example of searching a character string field (C185) is shown below:

C185 CN LOG

This example would retrieve all records that contain the word 'log' in the miscellaneous remarks field (C185). This might be a search for all remarks that contain "DATA FROM DRILLER'S LOG" in this field.

If more than one test is made, the tests must be connected with **OR** or **AND**. For example, the following would ensure that well depth (C28) is not missing and is less than 100 feet:

C28 NE -- and C28 LT 100

Note: “and” connectors are evaluated before “or” connectors. For example, the following test:

C28 LT 100 or C28 GT 500 and C16 GT 4000

is equivalent to:

C28 LT 100 or (C28 GT 500 and C16 GT 4000)

and passes records with:

1. Depth of well less than 100 feet, or
2. Depth of well greater than 500 feet and altitude greater than 4000 feet.

To make the following test:

(C28 LT 100 or C28 GT 500) and C16 GT 4000

you have to use:

C28 LT 100 and C16 GT 4000 or C28 GT 500 and C16 GT 4000

The “while” connector is available for use in testing fields from related files. The “while” connector is similar to “and” except that “while” requires the tests be passed in the same occurrence of the related file. For example, the test:

C237 GT 100 and C235 GT 1984

is passed if any occurrence of C237 is greater than 100, and if any occurrence of C235 is greater than 1984. However, the test:

C237 GT 100 while C235 GT 1984

is passed only if the conditions are met in the same occurrence of the related file, i.e. if the depth is greater than 100 feet in a measurement made after 1984. Note that the fields in tests connected with “while” must be in a single related file, while the tests connected with “and” may include fields from the sitefile or any related files.

Detailed tests cannot be completed for owner name, owner address, owner phone number, contact name, contact address, or contact phone number. If such a test is attempted, the test will be disallowed and a message will be displayed. This functionality was removed for NWIS Release 4.3, Patch 2 to comply with the Privacy Act during a review of NWIS security issues.

If a detailed test is made on a field in one of the associated GWSI files (in which fields may occur a number of times for each site), you may specify whether the test must be passed for all occurrences of the field for a particular site or if one occurrence is sufficient.

The program prompts for the component number, the operator, and the test value. If the component for the site can occur more than once, it also prompts for the number of occurrences required.

3. Site Type

Enter codes for site type to be included --
 If no type is specified, all types will be selected.
 Enter ? for list of types, or <CR> to end.
 Enter site type (A "*" in column 3 selects all sub-types):

Site types available --

GL	)	Glacier
WE	)	Wetland
LA	)	Land
LA-EX	)	Excavation
LA-OU	)	Outcrop
LA-SNK	)	Sinkhole
LA-SH	)	Soil hole
LA-SR	)	Shore
AT	)	Atmosphere
ES	)	Estuary
OC	)	Ocean
OC-CO	)	Coastal
LK	)	Lake, Reservoir, Impoundment
ST	)	Stream
ST-CA	)	Canal
ST-DCH	)	Ditch
ST-TS	)	Tidal stream
SP	)	Spring
GW	)	Well
GW-CR	)	Collector or Ranney type well
GW-EX	)	Extensometer well
GW-HZ	)	Hyporheic-zone well
GW-IW	)	Interconnected wells
GW-MW	)	Multiple wells
GW-TH	)	Test hole not completed as a well
SB	)	Subsurface
SB-CV	)	Cave
SB-GWD	)	Groundwater drain
SB-TSM	)	Tunnel, shaft, or mine

Site Types (continued)		
SB-UZ	)	Unsaturated zone
FA	)	Facility
FA-CI	)	Cistern
FA-CS	)	Combined sewer
FA-DV	)	Diversion
FA-FON	)	Field, Pasture, Orchard, or Nursery
FA-GC	)	Golf course
FA-HP	)	Hydroelectric plant
FA-QC	)	Laboratory or sample-preparation area
FA-LF	)	Landfill
FA-OF	)	Outfall
FA-PV	)	Pavement
FA-SPS	)	Septic system
FA-STS	)	Storm sewer
FA-TEP	)	Thermoelectric plant
FA-WIW	)	Waste injection well
FA-SEW	)	Wastewater sewer
FA-WWD	)	Wastewater disposal
FA-WWTP	)	Wastewater-treatment plant
FA-WDS	)	Water-distribution system
FA-WTP	)	Water-supply treatment plant
FA-WU	)	Water-use establishment
AG	)	Aggregate ground-water use
AS	)	Aggregate surface-water-use
AW	)	Aggregate water-use establishment
SS	)	Specific Source

This option allows you to further restrict your retrieval by limiting the site types to be included based on the value of C802 ([Section 1.9](#)).

4. Maximum number of sites to retrieve by gross selection

This option allows you to enter the maximum number of sites that the software should allow for the gross selection of sites before beginning the next test. The default entry is zero, which indicates no limit is included.

5. Maximum number of sites to pass polygon, detail and type tests

This option allows you to enter the maximum number of sites that the software should allow for the polygon, detail, and site type tests before beginning the next test. The default entry is zero, which indicates no limit is included.

6. Maximum number of records to output for tabling

This option allows you to enter the maximum number of records that the software should allow in the output for tabling. The default entry is zero, which indicates no limit is included.

*****NEW OPTION AT NWIS 4.4*****

7. Retrieval restriction options

This option was implemented to satisfy security concerns regarding data requests. It allows users to easily qualify retrievals for public requests. Entire sites or data values within a site, which meet the restriction criteria, will be excluded from the retrieval. Restrictions are based on the Web Flag, which in turn is controlled by whether or not the data is proprietary, local use, and passed data checks. Water-quality data that is retrieved will also be subject to any retrieval restrictions that have been placed on it in the water-quality database, such as [Data Quality Indicator \(DOI\) Codes](#). **It is important to note that the default is option A, which applies all restrictions to a retrieval.** This was necessary to satisfy security concerns that precautions are taken to keep sensitive data from being released. When all restrictions are applied, the default retrieval, the data retrieved from GWSI are the same data that are available from NWISWeb. More than one option may be entered. This allows users to combine the middle three options in any combination desired. To obtain the list of retrieval options invoke option 7 as shown below:

```

Enter item number to change, R to re-list items or <CR> to continue: 7
Enter restriction options (<CR>=ALL Restrictions): ?
Restriction options are (-,P,L,N,A):

-) No Exclusions, Retrieve All Sites/Data
P) Exclude Proprietary Sites/Data
L) Exclude Local Use Sites/Data
N) Exclude Sites/Data Failing Checks
A) Exclude Sites/Data Restricted From The Web

You may enter more than one exclusion option.

Enter restriction options (<CR>=ALL Restrictions):
    
```

Note: Choosing the '-' (dash), No Exclusions, option will return the traditional output.

8.2.5 Format of Output

The next set of information you will enter will describe the format of your output:

Specify format (1=Std, 2=Dump, 3=Subfile, 4=Special (<CR>=1): 3

The following output formats are available -

(1) Standard table with fields appearing horizontally across the page while sites/records are listed vertically down the page. Up to 25 pages(max 200 chars ea) of fields may be specified. You may specify that certain fields appear on each page whenever more than one page is required to list all the fields requested.

(2) Dump-format table in which selected fields for a single site appear vertically down the page. This format is advantageous for presenting the data for a site in a compact form.

(3) Subfile format in which selected fields appear in a machine-readable form in a file without column headings or spaces between fields. This format is useful as input to other programs for plotting, statistical analysis, etc. A table listing the fields available in the subfile together with field locations and field lengths is produced except for RDB files, which include the information in the file header.

(4) Special formats, water levels.

The format you choose will determine the next set of queries you will see:

8.2.5.1 Standard Table Format

The standard table format allows you to include component numbers or other options for each column in the output. Fields to include on the output report must be specified. If more fields are specified than will fit on one page of a standard table, a multiple-page report (up to 20 pages) is created automatically. You may specify that certain fields appear on each page of a multi-page report. For example, you may wish to print Site IDs on each page. The width of any page may be limited by forcing a field to begin a new page. The location where fields will appear on the output is displayed as the field code is requested. The page and column location is displayed as "(Pg:xx,Col:xxx)".

```

Enter file name for output table (<CR>=gw.table):

Enter the title you wish to appear at the top of each page (upper/lower case) --
Title
GWSI RETRIEVAL/TABLING - NWIS-4_4_0-20040329   STANDARD FORMAT --

Define fields to be output --

  Enter field code or "WIDTH" to define page width, "SPACE" to force non-std
  spacing or "PAGE" to force next field on new page.  Enter <CR> to end.

(Pg:01,Col:001) - Enter field code/options: c4
(Pg:01,Col:009) - Enter field code/options: c1
(Pg:01,Col:026) - Enter field code/options:

Enter item number to change, R to re-list items or <CR> to continue:
    
```

A list of components is available in [Chapter 8 – Components Appendix](#). In addition to component numbers you can enter options for temporary fields ([Section 8.3.2](#)) or statistics codes ([Section 8.3.3](#)). After you have entered all the information you want to include in the output, you will be given the opportunity to review and modify your choices:

```
Current output format specifications -

(01) Table type: 1 (Standard)
(02) File name: gw.table
(03) Title:
(04) Print destination:
(05) Forms page length:      58
(06) Force upper case? N
(07) Page break field: (none)
(08) Fields to be output --
    C004 C001
(09) Round numeric values on output? N
(10) Rounding exceptions: (none)
(11) Output will not be sorted

Enter item number to change, R to re-list items or <CR> to continue:
```

The output file (default name gw.table) is generated by the program. The file may be printed from the program or printed later. At the end of the setup, any or all of the retrieval/tabling specifications may be selectively reviewed or reentered. See [Section 8.2.6](#) for details on each output option. The setup specifications may be saved in a control file. This file can then be used in a subsequent execution of this program. Future retrievals can be simplified by beginning with a similar retrieval/tabling execution. With this capability, you may generate one or more “canned” setups for recurring retrievals or for use as a pattern for typical retrievals or tables.

8.2.5.2 Dump Format

The dump format includes a row for each element of data for each site selected.

```
Specify format (1=Std, 2=Dump 3=Subfile, 4=Special (<CR>=1): 2
GWSI RETRIEVAL/TABLING - NWIS-4_4_0-20040329   FORMAT OF OUTPUT -
-

Enter file name for output table (<CR>=gw.table):

Enter the title you wish to appear at the top of each page
(upper/lower case) --

GWSI RETRIEVAL/TABLING - NWIS-4_4_0-20040329   DUMP FORMAT --

Which field set do you wish to use (1=Default, 2=Select, 3=All)?
```

You can select a default set of components, select individual components, or include all components in the dump format output.

The default set of components includes:

C001 C012 C013 C009 C010 C008 C093 C020 C024

If “Select” fields is chosen, the user will be prompted to enter selected fields that will be displayed in the vertical format of the dump type table. They may be entered individually. If a component number is preceded by an exclamation point (e.g., !C180), that field and all related fields will be included in the output. For example, if !C80 is entered for a component number, C80 (Casing material) and all related fields for casing will be included in the output. This selection will be included in the output specifications summary screen. This is opposite behavior to the “All” option below.

If “All” fields is selected, the user will be prompted to enter fields that are to be excluded from the table. They may be entered individually and if the user enters a component number preceded by an exclamation point (e.g. !C16), that field and all related fields will be excluded from the selection process. If, for example, !C16 (altitude of site) is typed in response to the prompt, then C16, which is part of the Sitefile record, and all Sitefile fields will be excluded from the selection. This is opposite behavior from the “Select” option above. The excluded fields will be indicated when the summary of output specifications is displayed. Another useful application of this utility is exclusion of all field water-quality data. At the prompt, type !C776 (Field qw record entry record QUAL). Carriage return and then type !C791 (Field qw values record QVAL). To exclude all water-level (LEV) records, enter !C235.

After you make your component selection, you will be asked if you want fields with no data included in the output and whether you want to restrict output of related files:

Do you wish to print empty fields (Y/N,<CR>=N)?

Do you wish to restrict output of related files (Y/N,<CR>=N)?

Related Files:

Anything not found in the Sitefile is found in a related GWSI file. Items in the Sitefile are listed in [Chapter 2](#). You are queried about restricting the output of related files only if a component from a related file has been selected for output.

Note: Components in the Sitefile can occur only one time for the site [e.g., (C12)--local well number]. Components in the related GWSI file can occur multiple times for the site [e.g., (C79)--diameter of casing].

For restricting output from related files, the following operators can be used:

EQ Equals	NE Not equal
GT Greater Than	LT Less Than
GE Greater than or Equal to	LE Less Than or Equal to
IN In range of	EX Outside range -- For character strings only
CN Contains	NC does Not contain

The “@” operator may be used to restrict selection of records to particular occurrences of a related file record for each site. The following “@” operators are available:

@F Select the first n records for a site.

@L Select the last n records.

@N Select every nth record.

If you choose one of these operators you will be prompted to enter “n.”

If you output a field from any of the related GWSI files, an opportunity is provided to specify the extent of the output from the related file by answering “Y” to the following prompt “Do you want to restrict the output of related files?”. If you answer “Y,” you are prompted to specify tests similar to those of the [detail tests \(Section 8.2.4\)](#) used in site selection.

At the end of the setup, any or all of the retrieval/tabling specifications may be selectively reviewed or reentered. See [section 8.2.6](#) for details on each output option. The setup specifications may be saved in a control file. This file can then be used in a subsequent execution of this program. Future retrievals can be simplified by beginning with a similar retrieval/tabling execution. With this capability, you may generate one or more “canned” setups for recurring retrievals or for use as a pattern for typical retrievals or tables.

8.2.5.3 Subfile Format

The subfile format includes components in a machine-readable form column headings or spaces between fields. This format is useful as input to other programs for plotting, statistical analysis, etc. In addition to the machine-readable output, a table listing the fields in the subfile, together with field locations and lengths, is produced. The prompts for the subfile format include naming the output file and entering a list of component numbers. The output file (default name gw.subf) is generated by the program. The file may be printed from the program or printed later. A subfile format list (default name gw.subf.list) also can be generated. This file lists the location of each field in the file, along with its component number and description.

A list of components is available in [Chapter 8 – Components Appendix](#). In addition to component numbers you can enter options for temporary fields ([Section 8.3.2](#)) or statistics codes ([Section 8.3.3](#)).

RDB format can be retrieved using the subfile option. After selecting the subfile format and entering components to be included, then change option 3 in the output specifications for RDB format to “Y.”

```

Current output format specifications --
(01) Table type: 3 (Subfile)
(02) File name: gw.subf
(03) RDB format? Y
(04) Field list file name: gw.subf.list
(05) Print destination:
(06) Round numeric values on output? Y
(07) Rounding exceptions: (none)
(08) Rounding for component C237: by component C276
(09) Force upper case? N
(10) Right-justify numeric fields? Y
(11) Fields to be output --
      C004 C001 C012 C235 C237
(12) Output of related files is not restricted.
(13) Output will not be sorted.
Enter item number to change, R to re-list items, or to continue: 3

```

At the end of the setup, any or all of the retrieval/tabling specifications may be selectively reviewed or reentered. See [section 8.2.6](#) for details on each output option. The setup specifications may be saved in a control file. This file can then be used in a subsequent execution of this program. Future retrievals can be simplified by beginning with a similar retrieval/tabling execution. With this capability, you may generate one or more "canned" setups for recurring retrievals or for use as a pattern for typical retrievals or tables.

8.2.5.4 Special Table Format – Water Levels

After selecting option 4 from the format list, you will enter the output filename and the title to appear at the top of each page. The next query will require you to choose one of four types of water-level tables:

- (a) Daily water levels by year
- (b) Five-day water levels by year
- (c) Intermittent water levels by year
- (d) Intermittent water levels for multiple years

After selecting the type of water-level table for output, you will be queried for additional information including start year and ending year and heading formats:

```

Specify type water level table desired (1-4): 1
Enter year type (W/C/S,<CR>=W):
Enter start year (<CR>=first available):
Enter end year (<CR>=last available):
Current alternate headings type: R
Use the following headings for site description --
SITE:[C001 ]
LOCAL NUMBER:[C012 ]
Enter alternate headings type (N/R/A,<CR>=no change): ?

```

The heading options in the output table allow you to customize your water-level table:

- N -- None, use C270 if available.
- R -- Headings specified are to be used in place of C270 (may include C270).
- A -- Headings specified are to be used only if C270 is not available.

Site descriptions are normally obtained from observation well headings ([C270 - Chapter 2 - Section 7.9](#)). You may specify up to 20 lines of text/fields which are to be used instead of C270 or which are to be used if C270 data is not available. For each line you will need to enter 0-132 characters of text and/or one field. The field may either be C270 or any Sitefile field. For example, you might specify:

Alternate headings type = "A",
 "Site number:" for text and "C1" as field for line 1, and
 "Local number:" for text and "C12" as field for line 2.

Then the following would be printed as headings whenever C270 is not available:

Site number: (contents of C1)
 Local number: (contents of C12)

Note that either text or field data may be omitted from a line. For water-level tables types 3 and 4 also include an additional query:

```
Suppress status/method (Y/N,<CR>=N)?

NOTE: Specifying more water level groups than default
in next query requires print capability > 132 columns--
Enter number water level groups/line (1-09,<CR>=6):
```

The first query allows you to not include the water-level status or methods codes in the output with the water-level results. An entry of "Y" will prevent these codes from appearing in the output.

The second query allows you to choose how many columns for water levels will appear on each line of output. The maximum number of columns is nine.

The final query is about restricting output of related files:

```
Do you wish to restrict output of related files (Y/N,<CR>=N)?
```

See the section about [Related Fields](#) in the Dump Format output above.

At the end of the setup, any or all of the retrieval/tabling specifications may be selectively reviewed or reentered. See [section 8.2.6](#) for details on each output option. The setup specifications may be saved in a control file. This file can then be used in a subsequent

execution of this program. This allows the beginning of your retrieval/tabling design from a similar retrieval/tabling execution. With this capability, you may generate one or more “canned” setups for recurring retrievals or for use as a pattern for typical retrievals or tables.

8.2.6 Output Options

There are a number of options for the output tables or files. Some of these options are prompted for and others have supplied defaults. In either case, a table of the applicable options is displayed. You may change one or more of the following options:

1. Table Type. If this option is selected, the user will be sent back to the beginning of the Format of Output process to select the desired table type.
2. File name. The name of the output file can be changed.
3. Title. The title (up to 80 characters) may be changed. This option does not apply to subfiles.
4. Print destination. A printer other than the system default printer may be specified.
5. Print forms. Forms other than the default system forms may be specified.
6. Page length. The default page length is 58 lines, but this may be changed to any value between 10 and 160 lines to allow printing on various forms and devices.
7. Rounding of numeric fields. Rounding specifications for the entire retrieval are initially set by default. There are two types of default settings: (1) The program default is set to “N,” or (2) The district default, specified in /usr/opt/nwis/support/gw.table.parms file. The district default file is usually created to enforce a district standard for rounding. The default setting may be toggled by typing in the number for this field displayed in the “Output Format Specifications” at the prompt for changing an item on the specs and hitting <Return>. Rounding is applied according to data dictionary specifications for each component in the table when set to “Y.”
8. Rounding exceptions. You may specify one or more fields as exceptions to whatever rounding was selected in option (7) above. If you specify no rounding, you may also specify that one or more (up to 20) components be rounded. Similarly, if you select rounding, you may also specify up to 20 components where no rounding is applied.
9. Rounding for C16. Normally, site altitude (C16) is rounded according to the value of altitude accuracy (C18). You have the option of using the rounding specifications from the data dictionary for this component.
10. Rounding for C237. Normally, water levels (C237) are rounded according to the value of water-level accuracy (C276). This option uses the rounding specifications from the data dictionary for this component.
11. Force uppercase. You may force character field output in uppercase.
12. Right-justify numeric fields. Normally, numeric fields are printed with decimal points aligned. This option provides for right-justification of numeric fields.
13. Printing empty fields. Normally, empty fields are not printed in dump format. This option provides for forcing output of empty fields, and only applies to the dump format tables.

14. Years to process. This option applies to water-levels tables only, and provides for specifying the period to be tabled.
15. Start, end months. This option applies to water levels only and provides for specifying a partial year to be tabled. It also allows tabling of year types other than water year (the default) where the starting month is October and the ending month is September.
16. Number water-level groups per line. This option applies only to intermittent water levels. If page sizes narrower than 132 characters are required, this option provides for displaying fewer than the default number of groups.
17. Water-levels subtitle. This option allows the default subtitle, WATER LEVELS IN FEET BELOW LAND SURFACE, to be changed.
18. Print period-of-record summary. Normally, a period-of-record summary is not included on water-levels tables. This option provides for printing a summary for the entire period of record, even though only a partial period is being tabled.
19. Print record available line. Normally, a line indicating the period of record available is not printed. This option provides for printing such a line, and applies only to water levels.
20. Status types to include. Normally, summaries of water levels include all status types. This option provides for including only specific status types in summaries. For example, you may wish to include only static water-level measurements in summaries.
21. Field to table in water levels. Normally, water levels are tables of the values of component C237 (water level). This option provides for tabling some other field, such as elevation of water (a temporary field calculated from site altitude and water level).
22. Page break field. You may specify a field for which a page eject occurs whenever the value of the field changes. This option applies to type 1 and water-levels tables (except for daily tables).
23. Page break on site change. Normally, dump format tables are printed with one blank line separating sites. This option provides for forcing a page eject whenever the site changes. This option applies only to dump format tables.
24. Alternate headings. Normally, component C270 (observation well headings) is for describing sites for water-levels tables. This option provides for specifying combinations of literal text and component values used as site descriptions.
25. Limit related file output. Normally, all data available in the related files are tabled for each site selected. This option provides for limiting the tabling of related file output according to the values of the fields being tabled.
26. Permute related file output. Provides for tabling all possible combinations of fields when data are being tabled from more than one related file.
27. Sorting. Normally, tables and subfiles are output in the order that the data are available in the Sitefile and the related files. This option provides for sorting the output for up to 20 different fields, and in an ascending or a descending direction.

8.2.7 Processing Parameters

When all specifications are complete, the program asks for the processing parameters. There are five options for processing:

1. **(I) Interactive.** Control remains with the terminal.
2. **(P) Phantom.** Control of this retrieval reverts to a background process. The background process begins immediately with control of the terminal released to the user.
3. **(B) Batch.** A file is generated to be run later as a batch job. Instructions for this option are provided within the program.
4. **(R) Revise/modify** the setup.
5. **(Q) Quit.** Terminate the retrieval.

The first processing option would be used for reasonably short retrievals. The second option would be used if the retrieval would take longer and the user needs the terminal, perhaps to begin another retrieval. Jobs that are completed either using the phantom or batch options will create two additional files. An input file (default name gw.cpl) and an output file (default name gw.como) are created. The input file controls the phantom or batch job while the output file records the results.

The third option is most useful for systems that are overloaded and when the retrieval is not needed immediately. A batch job has the least impact on other users and could even be run during the middle of the night. If you specify batch, further processing of your retrieval will not be done interactively. You will be prompted to specify names for files required for processing. When the batch job is complete, you may reenter this program to display or print the output. There are three additional options allowed at this time:

1. Control file generation
2. **(S)** Generation of a list of sites that passed all tests
3. **(@)** Selection of database number

The control file contains all of the specifications from this program execution. The control file could serve as a record of the retrieval specifications. It also can be used as a starting place for a later program execution. During the later program execution, any of the specifications can be changed. The control file is nice to have in case the retrieval/table is close to, but not exactly, what you wanted. The control file can then be used and specifications can be modified. A series of control files can be generated for typical retrievals done in the District. These control files then become “canned programs” that each user can modify to generate “tailored programs.”

The file containing the list of sites in a subsequent retrieval can be used for gross selection. A UNIX editor can be used later to add or delete sites from this file to get absolute control over those sites selected.

The database(s) to be processed can be specified by appending a string of database numbers preceded by @. For example, including @2 would indicate that database number 2 is to be processed, while including @2,4 would indicate that databases 2 and 4

are to be processed and **@2-4,6** would indicate that databases 2, 3, 4, and 6 are to be processed. The default is **@1**.

The default for processing parameters is **I@1**, which indicates interactive processing of database 1. If, for example, you wish to process database 2 as a phantom job and create a file of the sites selected, you might respond **PS@2**.

8.3 Fields Available

All fields in the Sitefile and the associated GWSI files are available to this program. Fields are identified by component numbers. A list of valid components is available in [Chapter 8 – Components Appendix](#). Fields (components) are specified by entering the code **Cxxx** for the field desired. Enter **M** in place of **C** if the metric equivalent of the field is required. You need not enter leading zeros in field codes. Use the GWSI coding manual or the GWSI coding form to determine the component numbers; these are also found in the file named: /usr/opt/nwis/doc/data.dictionary. You can ask the program for a list of component numbers.

A modification to the program in NWIS 4.4 allows decimal-degree latitude and longitude (C909 and C910, respectively) to be retrieved with as many decimal places as possible. This modification was in response to a truncation error in earlier versions.

If you enter a field code with a prefix of **?**, a field description is displayed. You are then asked to confirm the field before it is used. For example, if **?C28** is entered in response to the prompt “Enter field code:” the following is displayed:

```
That field is: Depth of well
File: Sitefile

Enter <Enter> to accept, "R" to reject
```

If **<Enter>** is pressed, the field is used. If **R** is entered, the field is not used and you are asked to enter another field code. A display of the fields available may be obtained any time a field code entry is requested. Enter **+** for a complete list or **+Cxxx** for a list of 20 components beginning with field **Cxxx**. A list of 20 components is displayed; choose to either continue the display of components or to resume normal processing.

8.3.1 Water-quality retrievals

The retrieval program makes it possible to table selected water-quality data that are stored in the water-quality database. The GWSI water-quality components include:

- C193 – Date and time of sample
- C195 – Aquifer Sampled
- C196 – Water-quality Parameter Code
- C197 – Value of QW Parameter Code
- C738 – QW Sample ID

For GWSI, the QW Parameter Codes are limited to:

- 00003 – Sample Depth
- 00010 – Water Temperature
- 00020 – Air Temperature
- 00095 – Conductance
- 00300 – Dissolved Oxygen
- 00400 – pH
- 00410 – Alk, Titr pH 4.5
- 00430 – Alk, Carbonate
- 00440 – Bicarbonate
- 00940 – Chloride

Retrieval of any water-quality data is restricted by the data quality indicator code (DQI) that is stored with a result value. For more details about the DQI code, please refer to [Section 3.4.3.4](#) of the QWDATA User Documentation.

One way to display water-quality data in tables is by specifying the desired component numbers. An example of a standard table, where components C1, C738, C193, C195, C196, and C197 are specified at the prompts for output, is shown below:

SITE-ID	SAMPLE RECORD NUMBER	DATE/TIME QUALITY PARAMETER MEASURED	AQUIFER SAMPLED	WATER-QUALITY PARAMETER CODE	VALUE OF WATER-QUALITY PARAMETER
474251114385217	99003756	199006011200	111MTLG	00003	50
	99003756	199006011200	111MTLG	00010	15.5
	99003756	199006011200	111MTLG	00020	5.6
	99003756	199006011200	111MTLG	00300	32.1
	99003756	199006011200	111MTLG	00400	7.3

A more desirable way to display water-quality data may be to display all the parameters for one sample on a single line. The retrieval/tabling program provides the capability to temporarily restructure QW data in a horizontal format to display specified parameters for each sample by using the QDATE and QAQFR designation, followed by the desired water-quality parameters. The water-quality parameters will be displayed under descriptive column headings for the parameters. For example, by specifying C1, QDATE, QAQFR, 00003, 00010, 00020, 00300, and 00400 at the prompts for output, the following table will result:

SITE-ID	DATE/TIME QUALITY PARAMETER MEASURED	AQUIFER SAMPLED	SAMPLE DEPTH (FEET) (00003)	WATER TEMP (DEG C) (00010)	AIR TEMP (DEG C) (00020)	OXYGEN, DISSOLVED (MG/L) (00300)	PH (STANDARD UNITS) (00400)
474251114385217	199006011200	111MTLG	50	15.5	5.6	32.1	7.3
	199012251800	111DDGP	75	1.4	4.5	55.3	7.1

Note: Do NOT combine QDATE/QAQFR designation with Water-Quality related components (C193, C195, C196, C197, and C738), or vice versa, when entering data output specifications, this will result in unpredictable table formats. For example, entering C1, C193, QDATE, 0010, 00020, C738 for data output specifications is NOT recommended.

8.3.2 Temporary Fields

Temporary fields contain the results of mathematical operations on numeric GWSI fields, or the results of some logical process on character GWSI fields. Up to 20 temporary fields may be created in table formats 1, 2, and 3; however, temporary fields do not work in table format 4 ([see section 8.2.5](#)).

Temporary fields are denoted as “T1,” “T2,” . . . “T999.” Temporary fields are entered at the prompt “Enter field code/options:” during specification of fields to be output; the user will be prompted for definition of the temporary field. Temporary fields may be used as any GWSI fields--for testing, output or sorting.

Numeric temporary fields contain the result of a sequence of operations on numeric constants and/or GWSI fields. The operations are defined using Reverse Polish Notation (RPN) that allows evaluation of algebraic expressions without regard for parentheses.

Operations are entered as operands (numeric values or fields) and/or one of the operators:

+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponential

The current value of a term is modified according to the operation specified. If no operator is included, a new term is started. If no operand is included, the operation is applied using the last term computed and the current term. Any equation can be reduced to a sequence of these RPN operations. For example, to define a temporary field equal to site altitude (C16) less well depth (C28), you would specify the following sequence:

C16 C28-

To define the more complex (rather nonsensical) expression:

(C16-C28) + (C28-100)^.5

you would specify the following sequence of operations:

C16 C28- C28 100- .5^ +

Note: If C16 is chosen for a temporary field you will be required to select a vertical datum (NGVD1929 or NAVD1988). If a mathematical function cannot be performed (such as square root of a negative number), no warning or error is issued. The value returned is the result of the function that can be performed.

Character temporary fields contain the result of a logical operation on a character GWSI field. The operations currently available are:

P - Partial field--extract a substring from a field.

S Sort key - create a sort key from any text field that contains township-range-section-qtr-seq in the specific format TTTRRRSSQQQNN

(e.g. 09S40E36ADAB01). This temporary field may be used to sort the output and will arrange sites from North to South by township, and order sites from West to East by range within township. This sort key will only work if the input field is in the specified format (see example) and is used in the sort list in the table output specifications.

J - Julian day number--convert a date field to a 5-character day number referenced to a specified year.

D - Degree conversion--convert latitude or longitude in degrees-minutes-seconds to a 9-digit decimal degrees with 4 decimal places.

B--Replace field with database number.

The easiest way to set up a character temporary field is to specify the field desired when prompted for field/definition, then enter either **P**, **S**, **J**, **D**, or **B** when prompted for an operation code. The program will then prompt for any other required data.

A special operator “=,” is available for either character or numeric fields. This operator is used to retrieve a particular occurrence of a field in a related file. The temporary field is set to the value of the first operand in that occurrence of the related file where the value of the second operand is equal to the third operand, a constant. For example, if temporary fields T1 and T2 were defined as:

T1: C115 C706= WL

T2: C115 C706= QW

then T1 would be set to the value of C115 (network begin year) for that occurrence of the related file where C706 (data type) is equal to “WL.” Similarly, T2 would be equal to C115 where C706 is “QW.” A variation of this operation allows the first or last occurrence of a related file field to be retrieved. For example, the temporary field T1, could be defined as:

C190 C190= @L

Then, T1 would be set to the value of the last occurrence of C190. Conversely, the operand @F would specify that the first occurrence is to be retrieved. This temporary field would be useful for sorting on a related file field when data is being retrieved from multiple related files. Whenever a temporary field is defined using the “=” operator, that field is evaluated before output for the site begins. Thus, the temporary field can be used much as a Sitefile field.

8.3.3 Statistic Fields

Statistic fields contain a statistic of the values for components that have related files. These fields are entered at the prompt “**Enter field code/options:**” during specification of fields to be output.

The statistic options are:

- C** - Count of non-missing occurrences
- T** – Total (sum of values) of occurrences
- H** - High (maximum) value
- L** - Low (minimum) value
- M** - Mean value
- S** - Standard deviation of values
- The following two are not allowed with the Cxxx/CTHLMS format:*
- 1** – First value
- N** – Nth (last) value

Two types of statistic field formats are available. They are:

- a) statistics for all sites in a retrieval, by selected component(s);

Cxxx/CTHLMS where **Cxxx** is the component number, and **CTH...** are the statistics requested for that component.

Ex. C237/HL = the **H**ighest and **L**owest water level (C237)

Note.-use of this format is only available with Table Type 1, and provides the statistics for the requested component(s) for all sites in the retrieval, not each site separately. For example, if a retrieval of water-level statistics (as above) was made for 5 sites, each of which had 50 water levels, the statistics presented will have been calculated from the combined 250 water levels.

- b) statistics for each site in a retrieval, by selected component(s);

@?xxx where **?** is the statistic desired and **xxx** is the component for which the statistic is computed.

Ex. @M237 would specify the mean value of component C237 (water level)

Statistic fields can be used just like site file components for testing, reporting, or for arguments to temporary fields.

8.4 Datum Conversions

Display of component values referenced to a datum may be converted to an alternate datum in the Standard Table format. When a component that is referenced to a horizontal or vertical datum is selected for display, the user will be prompted for the output format for all components referenced to the horizontal or vertical datum; once the output format is selected for the horizontal or vertical datum, that format is used for all related components. For example, if Option 2 is specified for component C9 (Latitude), the format specified in Option 2 is used for all other latitude and longitude fields. If the following field specifications for a standard table were entered, the table following the specifications would be output similar to the output below:

PAGE 1					
SITE-ID	ALTITUDE OF LAND SURFACE (FEET)	ALTITUDE DATUM (CODE)	LATITUDE (NAD1983) (DDMMSS)	LONGITUDE (NAD1983) (DDMMSS)	LATITUDE- LONGITUDE- CONVERTED FROM NAD1927
474251114385201	2878.57	NGVD29	474251	1143855	*
483318104105402	1977.00	NGVD29	483318	1041056	*
450937112393701	5237.00	NGVD29	450937	1123940	*
453107106110601	3020.00	NGVD29	453107	1061108	*

There are several components that are referenced to either a horizontal or vertical datum:

Component #	Description	Datum Type	Datum Component #
C009	Latitude (ddmmss)	Horizontal	C036
C909*	Latitude NAD83 (decimal degrees)	Horizontal	None
C010	Longitude (dddmmss)	Horizontal	C036
C910*	Longitude NAD83 (decimal degrees)	Horizontal	None
C016	Altitude of Land Surface	Vertical	C022
C325	Altitude of Measuring Point	Vertical	C328
C237	Water Level Below Land Surface Datum	Vertical	C245
C241	Water Level Below Measuring Point	Vertical	C245
C242	Water Level Referenced to Sea Level	Vertical	C245

Note: * Values included in output for decimal degrees of latitude and longitude (C909 and C910) will not be converted. Decimal degree output for these two components will only appear with NAD83 datum.

When a component that is referenced to a datum is selected for display in a table by the GW tabling program, the component value may be displayed as entered or converted to an alternate datum; in either case, the displayed value will be described as follows:

1. If the value is not to be converted, the datum associated with the component will automatically be included with the output.
2. If the value is converted from one datum to another, the value of the component will be converted and an indication of its having been converted will be displayed in the table. If the value is already stored in the specified datum, no processing will occur.

Datum conversions are performed using the North American Datum Conversion (NADCON) routines available from National Oceanic and Atmospheric Administration (NOAA). Horizontal conversions are performed between NAD27, which includes OLDAK, OLDPR, OLDHI, and OLDGUAM datums, and NAD83, provided that they fall within the latitude and longitude ranges accepted by NADCON. Vertical conversions are performed between NGVD29 and NAVD88, provided the corresponding coordinates fall within the latitude and longitude range of NADCON. The range for the NADCON vertical datum conversions are restricted to the “lower 48” states. If a requested datum conversion is not supported by NADCON, or the location of the datum is outside the range of NADCON, then the designation “NA” will be displayed in the table column indicating whether or not the value was converted. If “NA” is displayed, the value was

not converted, and steps should be taken to ensure that the displayed value is not interpreted as a converted value.

Components may be converted from one datum to another for all table types except the dump format; data are displayed as entered in the dump format. When any component referenced to a datum is displayed in a table, the datum is displayed, or there is an indication of whether or not the displayed value has been converted from one datum to another.

There are three options for displaying components referenced to horizontal datums:

1. Output values as stored. Component C036, the latitude-longitude datum, will be included automatically.
2. Output all values at NAD1927. Any NAD1983 values will be converted to NAD1927 and flagged as converted.
3. Output all values at NAD1983. Any NAD1927 values will be converted to NAD1983 and flagged as converted.

There are three options for displaying components referenced to altitude datums:

1. Output values as stored. Component C022, the altitude datum, will be included automatically.
2. Output all values at NGVD1929. Any NAVD1988 values will be converted to NGVD1929 and flagged as converted.
3. Output all values at NAVD1988. Any NGVD1929 values will be converted to NAVD1988 and flagged as converted.

There are three options for displaying components referenced to measuring point datums:

1. Output values as stored. Component C328, the measuring point datum, will be included automatically.
2. Output all values as NGVD1929. Any NAVD1988 values will be converted to NGVD1929 and flagged as converted.
3. Output all values as NAVD1988. Any NGVD1929 values will be converted to NAVD1988 and flagged as converted.

All table types except for the dump explained previously now have the functionality to display water-level data for a water-level type. This means that the user has the option to display all water levels retrieved, converted to the type requested. For example, if Water Level Below Land Surface Datum (LSD), C237 is tabled, the user now has the option to show all water levels stored as other water-level types (Measuring Point or Mean Sea Level) converted to Water Level Below LSD.

There are two options for displaying water levels:

1. Do not convert from other water-level types.
2. Convert from other water-level types when possible.

When option 1 is chosen, water levels stored with a water-level type other than the one requested, will be shown as dashes. When option 2 is chosen, water levels stored with a

water-level type other than the one requested, will be converted when possible. For example, water levels referenced to Mean Sea Level must be accompanied by an altitude datum to be converted.

8.4.1 Subfile Table Format

Display of component values referenced to a datum may be converted to an alternate datum in the Subfile Table format. When a component that is referenced to a horizontal or vertical datum is selected for display, the user will be prompted for the output format for all components referenced to the horizontal or vertical datum. Once the output format is selected for the horizontal or vertical datum, that format is used for all related components. For example, if Option 2 is specified for component C9 (Latitude), the format specified in Option 2 is used for all other latitude and longitude fields. For example, if the following field specifications for a subfile table are made the table following the specifications would be output:

Field Specifications

```
Specify fields to be included in the subfile.  Enter <CR> to end --

Enter field code: c1
Enter field code: c16
Enter altitude datum correction option (1-3/?,<CR>=1): ?

You have selected output of altitude.  You must specify how
you wish to handle datum corrections.

You have 3 options:
(1) Output values as stored.  Component C022, the
    altitude datum will be included automatically.
(2) Output all values at NAVD1929.  Any NAVD1988 values will be
    converted to NAVD1929 and flagged as converted.
(3) Output all values at NAVD1988.  Any NGVD1929 values will be
    converted to NAVD1988 and flagged as converted.
Enter altitude datum correction option (1-3/?,<CR>=1): 3
Enter field code: c9
Enter datum correction option (1-3/?,<CR>=1): 1
Inserting X004    ...
Enter field code:
Inserting C036    ...
```

Subfile Table Output

```
474251114385201 2882.59      *      474251NAD27
483318104105402 1978.63      *      483318NAD27
450937112393701 5240.86      *      450937NAD27
453107106110601 3022.19      *      453107NAD27
```

8.4.2 Special Table Format

Water levels displayed in the Special Table Format may be displayed as an altitude by requiring the Field to Table in WL Format to be C242 (Altitude of Water Surface) in the Table Specifications. This can occur if water levels are entered as Altitude or Water Surface (C242), if water levels are entered as depth below land surface datum (C237) and the Altitude of the site (C16) in the Sitefile is populated, or if water levels are entered as depth below MP (C241) and MP altitude (C325) is populated. Legacy data may not have the necessary collateral information available to display water levels as an altitude. If the “Field to Table in WL Format” is set to C242 the user will be prompted for which datum the water levels are to be displayed:

```
You have selected output of altitude of water surface (C242). You must
select a datum to be used for output values. You have 2 options:
  (2) Output values at NGVD1929.
  (3) Output values at NAVD1988.
Values will be converted as necessary.
Enter datum conversion option (2/3): 3
```

An example of table specifications and table output follow; user input is indicated by **bolded/underlined** response to prompts:

Field Specifications

```
Current output format specifications --
(01) Table type: 4 (Intermittent water levels, multiple years)
(02) File name: 4
(03) Title:
(04) Print destination:
(05) Forms page length: 58
(06) Round numeric values on output? Y
(07) Rounding exceptions: (none)
(08) Rounding for component C237: by component C276
(09) Force upper case? N
(10) Start year: 1980 End year: 1990
(11) Start month for tables: 10 End month: 09
(12) Suppress SM? N Number water level groups per line: 4
(13) WL sub-title: WATER LEVELS IN FEET BELOW LAND SURFACE DATUM
(14) Print period of record summary? N
(15) Field to table in WL format: C237 High extreme at low value? Y
(16) Page break field: (none)
```

```
Enter item number to change, R to re-list items or <CR> to continue: 15
Field to table (<CR>=C237)? c242
  You have selected output of altitude of water surface (C242). You must
  select a datum to be used for output values. You have 2 options:
    (2) Output values at NGVD1929.
    (3) Output values at NAVD1988.
Values will be converted as necessary.
Enter datum conversion option (2/3): 3
Enter item number to change, R to re-list items or <CR> to continue:
```

Special Table Output

DATE: 07/06/01		PAGE 1			
SITE: 474251114385201					
LOCAL NUMBER: 23N24W34ADAA01					
WATER SURFACE ELEVATION IN FEET (NAVD1988)					
DATE	WATER LEVEL MS	DATE	WATER LEVEL MS	DATE	WATER LEVEL MS
MAR 12, 1980	2776.53 S	MAY 23, 1984	2774.45 S	JAN 13, 1988	2776.70 S
JUL 14	2777.73 S	JUN 22	2771.51 S	FEB 19	2777.12 S
OCT 09	2778.65 S	AUG 27	2769.68 S	APR 07	2777.96 S
JAN 15, 1981	2779.38 S	SEP 28	2769.76 S	MAY 23	2774.74 S
APR 10	2779.87 S	OCT 01	2770.75 S	JUN 29	2773.41 S
JUL 17	2778.79 S	NOV 27	2771.98 S	JUL 14	2771.80 S
JAN 06, 1982	2777.54 S	JAN 18, 1985	2772.27 S	AUG 19	2769.78 S
21	2777.70 S	23	2772.22 S	OCT 04	2770.67 S
FEB 02	2777.59 S	24	2772.22 S	11	2770.94 S
MAR 17	2778.05 S	MAR 20	2772.68 S	NOV 23	2773.40 S

Note: Datum used is displayed in table heading "WATER SURFACE ELEVATION IN FEET (NAVD1988)."

Chapter 8 – Components Appendix

Table 1. GWSI components sorted by number

Component Number	Description	Chapter 2 Location
C001	Site ID (station number)	1.2
C003	Data Reliability	1.41
C004	Source agency code	1.1
C005	Project number	1.7
C006	District code	1.10
C007	State code	1.12
C008	County code	1.13
C009	Latitude	1.14
C010	Longitude	1.15
C011	Lat-long accuracy code	1.18
C012	Local well number	1.8
C013	Land-net location	1.25
C014	Name of location map	1.31
C015	Scale of location map	1.32
C016	Altitude of land surface	1.21
C017	Method altitude determined	1.23
C018	Altitude Accuracy	1.22
C019	Topographic setting	1.26
C020	Hydrologic unit code	1.27
C021	Date well constructed	1.42
C022	Altitude datum	1.24
C023	Primary use of site	1.43
C024	Primary use of water	1.46
C025	Secondary use of water (list w/C024)	1.47
C026	Tertiary use of water (list w/C024)	1.48
C027	Hole depth (depth drilled)	1.51
C028	Depth of well (finished depth)	1.52
C029	Source of depth data	1.53
C032	Record ready for Web	1.40
C035	Lat/Long Method	1.19
C036	Lat/Long datum	1.20
C038	Date lift installed or recorded	2.11.5.2
C039	National water-use code	1.34
C040	Date site record last updated	1.6
C041	Country code	1.11
C043	Type of lift	2.11.5.1
C044	Depth to intake	2.11.5.3
C045	Type of power	2.11.5.4
C046	Horsepower rating	2.11.5.5
C048	Manufacturer of lift device	2.11.5.6
C049	Serial number of lift device	2.11.5.7
C050	Name of power company	2.11.5.8
C051	Power company account number	2.11.5.9
C052	Power meter number	2.11.5.10
C053	Pump rating	2.11.5.11
C054	Company that maintains lift device	2.11.5.13
C056	Type of standby power	2.11.5.15

Component Number	Description	Chapter 2 Location
C057	Horsepower of standby power source (see list w/C045)	2.11.5.16
C059	Parent sequence number for HOLE subrecord of CONS file	2.4
C060	Date of construction	2.11.1.1
C061	Person creating record	1.3
C062	Person updating record	1.5
C063	Name of contractor	2.11.1.2
C064	Source of construction data (see list w/C029)	2.11.1.3
C065	Method of construction	2.11.1.4
C066	Type of finish	2.11.1.5
C067	Type of seal	2.11.1.6
C068	Depth to bottom of seal	2.11.1.7
C069	Method of development	2.11.1.8
C070	Hours of development	2.11.1.9
C071	Special treatment during development	2.11.1.10
C073	Depth to top of this hole interval	2.11.2.1
C074	Depth to bottom of this hole interval	2.11.2.2
C075	Diameter of this hole interval	2.11.2.3
C077	Depth to top of this casing string	2.11.3.1
C078	Depth to bottom of this casing string	2.11.3.2
C079	Diameter of this casing string	2.11.3.3
C080	Casing material	2.11.3.4
C081	Wall thickness of this casing	2.11.3.5
C083	Depth to top of this open interval	2.11.4.1
C084	Depth to bottom of this open interval	2.11.4.2
C085	Type of openings in this interval	2.11.4.5
C086	Material in this interval	2.11.4.4
C087	Diameter of this open interval	2.11.4.3
C088	Width of openings	2.11.4.7
C089	Length of openings	2.11.4.6
C091	Depth top of geohydrologic interval	6.11.1.1
C092	Depth to bottom of geohydrologic interval	6.11.1.2
C093	Unit identifier	6.11.1.3
C095	Aquifer date - geohydrologic	6.11.2.1
C096	Lithology code	6.11.1.4
C097	Description of material	6.11.1.6
C099	Record sequence no. or sequence no. of parent - COEF	8.4
C100	Hydraulic unit ID	8.11.1.1
C101	Test interval - top	8.11.1.2
C102	Test interval - bottom	8.11.1.3
C103	Hydraulic unit type	8.11.1.4
C104	Hydraulic remarks	8.11.1.5
C106	Record sequence number for COEF subrecord of HYDR file	8.5
C107	Transmissivity	8.11.2.1
C108	Horizontal conductivity	8.11.2.2
C109	Vertical conductivity	8.11.2.3
C110	Storage coefficient	8.11.2.4
C111	Leakance	8.11.2.5
C112	Diffusivity	8.11.2.6
C113	Specific storage	8.11.2.7

Component Number	Description	Chapter 2 Location
C115	Begin year of data collection	5.10.8.2
C116	End year of data collection	5.10.8.3
C117	Source agency for network data	5.10.8.5
C118	Frequency of data collection	5.10.8.6
C120	Type of analyses - QW network	5.10.8.4
C126	Aquifer static level	6.11.2.2
C132	Aquifer contribution (percent)	6.11.2.3
C133	Method of data collection	5.10.8.7
C147	Record sequence number	4.3
C148	Date discharge measured	4.4
C150	Discharge	4.11
C151	Source of discharge data	4.13
C152	Method discharge measured	4.14
C153	Production level	4.15
C154	Static water level	4.16
C155	Source of water-level data	4.17
C156	Method water level measured	4.18
C157	Duration of discharge	4.19
C159	Date of ownership	5.10.1.1
C161	Owner name	5.10.1.2
C165	Record number for repairs subrecord	2.4
C166	Nature of repairs	2.11.6.1
C167	Date of repairs	2.11.6.2
C169	Name of contractor who made repairs	2.11.6.3
C170	Percent change in performance after repairs	2.11.6.4
C172	Name of spring	2.11.7.1
C173	Type of spring	2.11.7.2
C174	Permanence of spring	2.11.7.3
C175	Sphere of discharge	2.11.7.4
C176	Improvements	2.11.7.5
C177	Number of spring openings	2.11.7.6
C178	Flow variability	2.11.7.7
C179	Basis of flow variability	2.11.7.8
C181	Other data type	5.10.4.1
C182	Other data location	5.10.4.2
C184	Remark-date	5.10.12.1
C185	Remarks -misc	5.10.12.2
C187	Date of visit	5.10.5.1
C188	Person who made visit	5.10.5.2
C190	Other identifier	5.10.3.1
C191	Assignor of other identifier	5.10.3.2
C199	Type of log	5.10.7.1
C200	Depth to top of logged interval	5.10.7.2
C201	Depth to bottom of logged interval	5.10.7.3
C202	Source of log data (see list w/C029)	5.10.7.4
C204	Number of wells/laterals in a group	5.10.9.1
C205	Depth of deepest well in group	5.10.9.2
C206	Depth of shallowest well in group	5.10.9.3
C207	Method wells in group constructed	5.10.9.4
C209	Length of pond, tunnel, or drain	5.10.9.6
C210	Width of pond, tunnel, or drain	5.10.9.7
C211	Depth of pond, tunnel, or drain	5.10.9.8
C213	Cooperator ID	5.10.11.1
C214	Registration number	5.10.11.2

Component Number	Description	Chapter 2 Location
C215	Inspection status	5.10.11.3
C216	Reason unapproved	5.10.11.4
C217	Date inspected	5.10.11.5
C218	Cooperator remarks	5.10.11.6
C220	Number of wells/laterals in a group	5.10.9.1
C221	Depth of lateral in collector well	5.10.9.11
C222	Length of lateral in collector well	5.10.9.12
C223	Diameter of lateral in collector well	5.10.9.13
C224	Mesh of screen in lateral	5.10.9.14
C225	Format of log data (see list w/C261)	5.10.7.5
C226	Location of log data	5.10.7.6
C235	Water-level measurement date	3.3
C236	Date accuracy code -water level	3.19
C237	Water level below LSD	3.11
C238	Water-level status	3.14
C239	Water-level method	3.15
C240	Water-level reference (stats) code	3.16
C241	Water level below MP	3.12
C242	Water level from Vertical Datum	3.13
C243	Water level referenced to code	3.10
C244	Source of water level	3.18
C245	Datum for altitude water surface	3.20
C246	ID of party making measurement	3.21
C247	Source Agency	3.22
C248	Sequence number of Measuring Point (MP) record	3.23
C249	Equipment Identifier	3.24
C251	Value-1 -misc	5.10.10.1
C252	Value-2 -misc	5.10.10.2
C253	Value-3 -misc	5.10.10.3
C254	Record number for lift subrecord	2.4
C255	Additional lift(above land surface)	2.11.5.12
C256	Parent sequence number	6.4
C257	Primary network	5.10.8.9
C261	Format of other data	5.10.4.3
C262	Diameter of well group	5.10.9.5
C263	Bearing of pond, tunnel, drain	5.10.9.9
C264	Dip of tunnel	5.10.9.10
C265	Remarks -spec	5.10.9.15
C266	Remarks -msvl	5.10.10.5
C267	Remarks -water level	3.25
C268	Rated pump capacity	2.11.5.14
C270	Well heading line -observation	7.9
C271	Barometric efficiency	8.11.2.8
C272	Specific capacity	4.20
C276	Accuracy code	3.17
C301	Secondary use of site (list w/C023)	1.44
C302	Tertiary use of site (list w/C023)	1.45
C303	Date site record created	1.4
C304	Contributing unit	6.11.1.5
C305	Hydraulic source agency	8.11.1.6
C306	Porosity	8.11.2.9
C307	Agency that analyzes samples	5.10.8.8
C309	Water-level drawdown	4.21
C311	Sequence no. f/RMKS	5.4

Component Number	Description	Chapter 2 Location
C312	Sequence no. f/OTDT	5.4
C313	Sequence no. f/MSVL	5.4
C314	Value-4 -miscellaneous	5.10.10.4
C315	Sequence number -observation	7.3
C321	Begin date for use of this meas. pt.	2.11.8.1
C322	End date for use of this meas. pt.	2.11.8.2
C323	Height of this measuring point	2.11.8.3
C324	Description of this measuring point	2.11.8.8
C325	Altitude of measuring point	2.11.8.4
C326	Method altitude determined	2.11.8.5
C327	Altitude accuracy of MPNT	2.11.8.6
C328	Altitude datum f/MPNT	2.11.8.7
C351	Owner phone number	5.10.1.5
C352	Access to owner name	5.10.1.6
C353	Owner address line 1	5.10.1.7
C354	Owner address line 2	5.10.1.8
C355	Owner City name	5.10.1.9
C356	Owner Postal code	5.10.1.10
C357	Owner ZIP code	5.10.1.11
C358	Owner Country name	5.10.1.12
C359	Access to owner phone/address	5.10.1.13
C361	Date of contact	5.10.2.1
C360	Owner Alias Name	5.10.1.5
C362	Contact name	5.10.2.2
C363	Contact phone number	5.10.2.3
C364	Access to Contact name	5.10.2.4
C365	Contact address line 1	5.10.2.5
C366	Contact address line 2	5.10.2.6
C367	Contact City name	5.10.2.7
C368	Contact Postal code	5.10.2.8
C369	Contact ZIP code	5.10.2.9
C370	Contact Country name	5.10.2.10
C371	Access to contact phone/address	5.10.2.11
C372	Contact Alias Name	5.10.2.4
C373	End Date of Contact	5.10.2.2
C403	User ID of person creating CONS	2.6
C404	Date record created f/CONS	2.7
C405	User ID of person updating CONS	2.8
C406	User ID of person creating HOLE	2.6
C407	Date created HOLE	2.7
C408	User ID of person updating HOLE	2.8
C409	User ID of person creating CSNG	2.6
C410	Date created CSNG	2.7
C411	User ID of person updating CSNG	2.8
C412	User ID of person creating OPEN	2.6
C413	Date created OPEN	2.7
C414	User ID of person updating OPEN	2.8
C415	User ID of person creating LIFT	2.6
C416	Date created LIFT	2.7
C417	User ID of person updating LIFT	2.8
C418	User ID of person creating REPR	2.6
C419	Date created REPR	2.7
C420	User ID of person updating REPR	2.8
C421	User ID of person creating SPNG	2.6
C422	Date created SPNG	2.7

Component Number	Description	Chapter 2 Location
C423	User ID of person updating SPNG	2.8
C424	User ID of person creating MPNT	2.6
C425	Date created MPNT	2.7
C426	User ID of person updating MPNT	2.8
C427	User ID of person creating WLEV file	3.5
C428	Date WLEV record created	3.6
C429	User ID of person updating WLEV rec.	3.7
C430	User ID of person creating dis. rec.	4.5
C431	Date DISC record created	4.6
C432	User ID of person updating dis. rec.	4.7
C433	User ID of person creating OWNR	5.5
C434	Date created OWNR	5.6
C435	User ID of person updating OWNR	5.7
C436	User ID of person creating OTID	5.5
C437	Date created OTID	5.6
C438	User ID of person updating OTID	5.7
C439	User ID of person creating OTDT	5.5
C440	Date created OTDT	5.6
C441	User ID of person updating OTDT	5.7
C442	User ID of person creating VIST	5.5
C443	Date created VIST	5.6
C444	User ID of person updating VIST	5.7
C445	User ID of person creating QUAL	5.5
C446	Date created QUAL	5.6
C447	User ID of person updating QUAL	5.7
C448	User ID of person creating LOGS	5.5
C449	Date created LOGS	5.6
C450	User ID of person updating LOGS	5.7
C451	User ID of person creating NETW	5.5
C452	Date created NETW	5.6
C453	User ID of person updating NETW	5.7
C454	User ID of person creating SPEC	5.5
C455	Date created SPEC	5.6
C456	User ID of person updating SPEC	5.7
C457	User ID of person creating MSVL	5.5
C458	Date created MSVL	5.6
C459	User ID of person updating MSVL	5.7
C460	User ID of person creating COOP	5.5
C461	Date created COOP	5.6
C462	User ID of person updating COOP	5.7
C463	User ID of person creating RMKS	5.5
C464	Date created RMKS	5.6
C465	User ID of person updating RMKS	5.7
C466	User ID of person updating GEOH rec.	6.6
C467	Date created GEOH record	6.7
C468	User ID of person updating GEOH rec.	6.8
C469	User ID of person creating AQFR	6.6
C470	Date created AQFR	6.7
C471	User ID of person updating AQFR	6.8
C472	User ID of person creating OBHD rec.	7.4
C473	Date created OBHD record	7.5
C474	User ID of person updating OBHD rec.	7.6
C475	User ID of person creating HYDR rec.	8.6
C476	Date created HYDR record	8.7
C477	User ID of person updating HYDR rec.	8.8

Component Number	Description	Chapter 2 Location
C478	User ID of person creating COEF	8.6
C479	Date created COEF	8.7
C480	User ID of person updating COEF	8.8
C702	Last update -discharge	4.8
C703	Discharge type	4.10
C706	Network data type -miscellaneous	5.10.8.1
C707	Last update -obs	7.7
C708	Network secondary -misc	5.10.8.10
C709	Measurement time -wl	3.4
C710	Date WLEV record updated	3.8
C711	Date site established/inventoried	1.37
C712	Data availability in other GW files	1.56
C713	Aquifer type code	1.49
C714	Aquifer code	1.50
C715	National aquifer code	1.51
C718	Sequence no. f/QWNR	5.4
C721	Record sequence no. for GEOH subrecord file	6.4
C723	Record number for construction subrecord	2.4
C724	Record number for hole subrecord	2.5
C725	Record number for casing subrecord	2.5
C726	Record number for openings subrecord	2.5
C727	Record number for spring subrecord	2.4
C728	Record number f/measuring point subrecord	2.4
C729	Sequence no. f/SPEC	5.4
C730	Sequence no. f/NETW	5.4
C734	Sequence no. f/COOP	5.4
C736	Sequence no. f/OTID	5.4
C737	Sequence no. f/VIST	5.4
C738	Sequence no. f/QUAL	5.4
C739	Sequence no. f/LOGS	5.4
C742	Record sequence no. of child (for AQFR only)	6.5
C744	Record type f/HYDR	8.3
C745	Last update f/HYDR	8.9
C746	Record type f/COEF	8.3
C747	Last update f/COEF	8.9
C748	Record type f/GEOH	6.3
C749	Last update f/GEOH	6.9
C750	Record type f/AQFR	6.3
C751	Last update f/AQFR	6.9
C752	Record type f/LIFT	2.3
C753	Last update f/LIFT	2.9
C754	Record type f/CONS	2.3
C755	Last update f/CONS	2.9
C756	Record type f/HOLE	2.3
C757	Last update f/HOLE	2.9
C758	Record type f/CSNG	2.3
C759	Last update f/CSNG	2.9
C760	Record type f/OPEN	2.3
C761	Last update f/OPEN	2.9
C762	Record type f/REPR	2.3
C763	Last update f/REPR	2.9

Component Number	Description	Chapter 2 Location
C764	Record type f/SPNG	2.3
C765	Last update f/SPNG	2.9
C766	Record type f/MPNT	2.3
C767	Last update f/MPNT	2.9
C768	Record type f/OWNR	5.3
C769	Last update f/OWNR	5.8
C770	Record type f/OTID	5.3
C771	Last update f/OTID	5.8
C772	Record type f/OTDT	5.3
C773	Last update f/OTDT	5.8
C774	Record type f/VIST	5.3
C775	Last update f/VIST	5.8
C776	Record type f/QUAL	5.3
C777	Last update f/QUAL	5.8
C778	Record type f/LOGS	5.3
C779	Last update f/LOGS	5.8
C780	Record type f/NETW	5.3
C781	Last update f/NETW	5.8
C782	Record type f/SPEC	5.3
C783	Last update f/SPEC	5.8
C784	Record type f/MSVL	5.3
C785	Last update f/MSVL	5.8
C786	Record type f/COOP	5.3
C787	Last update f/COOP	5.8
C788	Record type f/RMKS	5.3
C789	Last update f/RMKS	5.8
C790	Sequence no. f/HYDR	8.4
C801	Drainage basin code	1.28
C802	Site type codes	1.9
C803	Agency use of site code	1.33
C804	Type of data collected	1.35
C805	Instruments at site	1.36
C806	Station remarks field	1.38
C808	Drainage area	1.54
C809	Contributing drainage area	1.55
C813	Mean Greenwich time offset	1.29
C814	Local standard time flag	1.30
C850	Record ready for Web flag; CONS subrecord of CONS record	2.10
C851	Record ready for Web flag; HOLE subrecord of CONS record	2.10
C852	Record ready for Web flag; CSNG subrecord of CONS record	2.10
C853	Record ready for Web flag; OPEN subrecord of CONS record	2.10
C854	Record ready for Web flag; LIFT subrecord of CONS record	2.10
C855	Record ready for Web flag; REPR subrecord of CONS record	2.10
C856	Record ready for Web flag; SPNG subrecord of CONS record	2.10
C857	Record ready for Web flag; MPNT subrecord of CONS record	2.10
C858	Record ready for Web flag; WLEV Record	3.9

Component Number	Description	Chapter 2 Location
C859	Record ready for Web flag; Discharge record	4.9
C861	Record ready for Web flag; OTID subrecord of MISC record	5.9
C862	Record ready for Web flag; OTDT subrecord of MISC record	5.9
C863	Record ready for Web flag; VIST subrecord of MISC record	5.9
C864	Record ready for Web flag; QUAL subrecord of MISC record	5.9
C865	Record ready for Web flag; LOGS subrecord of MISC record	5.9
C866	Record ready for Web flag; NETW subrecord of MISC record	5.9
C867	Record ready for Web flag; SPEC subrecord of MISC record	5.9
C868	Record ready for Web flag; MSVL subrecord of MISC record	5.9
C869	Record ready for Web flag; COOP subrecord of MISC record	5.9
C870	Record ready for Web flag; RMKS subrecord of MISC record	5.9
C871	Record ready for Web flag; GEOH Record	6.10
C872	Record ready for Web flag; AQFR subrecord of GEOH record	6.10
C873	Record ready for Web flag; OBHD record	7.8
C874	Record ready for Web flag; HYDR Record	8.10
C875	Record ready for Web flag; COEF subrecord of HYDR record	8.10
C900	Station name	1.8
C901	Parent sequence number for CSNG subrecord of CONS file	2.4
C902	Parent sequence number for OPEN subrecord of CONS file	2.4
C909	Latitude NAD83 (decimal degrees)	1.16
C910	Longitude NAD83 (decimal degrees)	1.17

Table 2. Components sorted by key word

Component Number	Description	File	Subfile
C051	Power-company ACCOUNT number	CONS	LIFT
C011	Lat-long ACCURACY code	SITE	--
C018	Altitude ACCURACY	SITE	--
C327	Altitude ACCURACY	CONS	MPNT
C179	ACCURACY of flow variability	CONS	SPNG
C236	Date ACCURACY code -wl	WLEV	--
C276	ACCURACY code	WLEV	--
C255	ADDITIONAL lift (above land surface)	CONS	LIFT
C004	Source AGENCY code	SITE	--
C117	Source AGENCY for network data	MISC	NETW
C305	Hydraulic source AGENCY	HYDR	HYDR
C307	AGENCY that analyzes samples	MISC	NETW
C803	AGENCY use of site code	SITE	--
C298	Water use, legal ALLOWANCE	WUSE	--
C022	ALTITUDE datum	SITE	--
C328	ALTITUDE datum	CONS	MPNT
C016	ALTITUDE of land surface	SITE	--
C325	ALTITUDE of measuring point	CONS	MPNT
C017	Method ALTITUDE determined	SITE	--
C018	ALTITUDE accuracy	SITE	--
C327	ALTITUDE accuracy	CONS	MPNT
C245	Datum for ALTITUDE water surface	WLEV	--
C120	Type of ANALYSES - QW network	MISC	NETW
C307	Agency that ANALYZES samples	MISC	NETW
C751	Last update for AQFR rec of GEOH file	LOGS	AQFR
C093	AQUIFER code	LOGS	GEOH
C095	AQUIFER date -geo	LOGS	AQFR
C126	AQUIFER-static-level	LOGS	AQFR
C132	AQUIFER contribution	LOGS	AQFR
C195	AQUIFER sampled	MISC	QUAL
C713	AQUIFER-type code	SITE	--
C714	AQUIFER code	SITE	--
C808	Drainage AREA	SITE	--
C809	Contributing drainage AREA	SITE	--
C191	ASSIGNOR of other identifier	MISC	OTID
C712	Data AVAIL in other Ground Water files	SITE	--
C263	Bearing (AZIM) of pond, tunnel, or drain	MISC	SPEC
C271	BAROMETRIC efficiency	HYDR	COEF
C807	BASE Discharge	SITE	--
C801	Drainage BASIN Code	SITE	--
C263	BEARING (azim) of pond, tunnel, or drain	MISC	SPEC
C115	BEGIN year of data collection	MISC	NETW
C321	BEGIN date for use of this measuring pt	CONS	MPNT
C074	Depth to BOTTOM of this interval	CONS	HOLE
C078	Depth to BOTTOM of this casing string	CONS	CSNG
C084	Depth to BOTTOM of this open interval	CONS	OPEN
C092	Depth to BOTTOM of interval	LOGS	GEOH
C102	Test interval -BOTTOM	HYDR	HYDR
C201	Depth to BOTTOM of logged interval	MISC	LOGS
C268	Rated CAPACITY of the lift device	CONS	LIFT

Component Number	Description	File	Subfile
C272	Specific CAPACITY -discharge	DISC	--
C077	Depth to top of this CASING string	CONS	CSNG
C078	Depth to bottom of this CASING string	CONS	CSNG
C079	Diameter of this CASING string	CONS	CSNG
C080	CASING material	CONS	CSNG
C081	Wall thickness of this CASING	CONS	CSNG
C278	CERTIFICATE number	WUSE	--
C170	Pct CHANGE in performance after repairs	CONS	REPR
C747	Last update for COEF rec of HYDR file	HYDR	COEF
C053	Power-consumption COEFFICIENT	CONS	LIFT
C110	Storage COEFFICIENT	HYDR	COEF
C804	Flags-type of data COLLECTED (30)	SITE	--
C115	Begin year of data COLLECTION	MISC	NETW
C116	End year of data COLLECTION	MISC	NETW
C118	Frequency of data COLLECTION	MISC	NETW
C133	Method of data COLLECTION	MISC	NETW
C221	Depth of lateral in COLLECTOR well	MISC	SPEC
C222	Length of lateral in COLLECTOR well	MISC	SPEC
C223	Diameter of lateral in COLLECTOR well	MISC	SPEC
C050	Name of power COMPANY	CONS	LIFT
C051	Power-COMPANY account number	CONS	LIFT
C054	COMPANY that maintains lift device	CONS	LIFT
C108	Horizontal CONDUCTIVITY	HYDR	COEF
C109	Vertical CONDUCTIVITY	HYDR	COEF
C755	Last update for CONS rec of CONS file	CONS	CONS
C021	Date well CONSTRUCTED	SITE	--
C207	Method wells in group CONSTRUCTED	MISC	SPEC
C060	Date of CONSTRUCTION	CONS	CONS
C065	Method of CONSTRUCTION	CONS	CONS
C064	Source of CONSTRUCTION data	CONS	CONS
C053	Power-CONSUMPTION coefficient	CONS	LIFT
C063	Name of CONTRACTOR	CONS	CONS
C169	Name of CONTRACTOR who made repairs	CONS	REPR
C214	CONTRACTORS -misc	MISC	COOP
C132	Aquifer CONTRIBUTION	LOGS	AQFR
C304	CONTRIBUTING unit	LOGS	GEOH
C809	CONTRIBUTING drainage area	SITE	--
C787	Last update for COOP rec of MISC file	MISC	COOP
C213	COOPERATORS id -misc	MISC	COOP
C218	COOPERATORS remarks	MISC	COOP
C008	COUNTY code	SITE	--
C303	Date site record CREATED	SITE	--
C404	Date cons record CREATED	CONS	--
C407	Date hole record CREATED	CONS	HOLE
C410	Date casing record CREATED	CONS	CSNG
C413	Date open record CREATED	CONS	OPEN
C416	Date lift record CREATED	CONS	LIFT
C419	Date repr record CREATED	CONS	REPR
C422	Date spring record CREATED	CONS	SPNG
C425	Date measuring-point record CREATED	CONS	MPNT
C428	Date water-level record CREATED	WLEV	--
C431	Date discharge record CREATED	DISC	--
C434	Date owner subrecord CREATED	MISC	OWNR
C437	Date OTID subrecord CREATED	MISC	OTID

Component Number	Description	File	Subfile
C440	Date OTDT subrecord CREATED	MISC	OTDT
C443	Date VIST subrecord CREATED	MISC	VIST
C446	Date QUAL subrecord CREATED	MISC	QUAL
C449	Date LOGS subrecord CREATED	MISC	LOGS
C452	Date NETW subrecord CREATED	MISC	NETW
C455	Date SPEC subrecord CREATED	MISC	SPEC
C458	Date MSVL subrecord CREATED	MISC	MSVL
C461	Date COOP subrecord CREATED	MISC	COOP
C464	Date RMKS subrecord CREATED	MISC	RMKS
C467	Date GEOH record CREATED	GEOH	--
C470	Date AQFR subrecord CREATED	GEOH	AQFR
C473	Date observation-well headings record created	OBHD	--
C476	Date hydraulics file CREATED	HYDR	
C479	Date COEF subrecord CREATED	HYDR	COEF
C810	CREST-STAGE upstream elevation	SITE	--
C811	CREST-STAGE downstream elevation	SITE	--
C759	Last update for CSNG rec of CONS file	CONS	CSNG
C003	DATA Reliability	SITE	--
C021	DATE well constructed	SITE	--
C038	DATE lift data collected	CONS	LIFT
C303	DATE record created	SITE	--
C040	DATE site record last updated	SITE	--
C060	DATE of construction	CONS	CONS
C095	Aquifer DATE -geo	LOGS	AQFR
C148	DATE discharge measured	DISC	--
C159	DATE of ownership	MISC	OWNR
C167	DATE of repairs	CONS	REPR
C184	Remark-DATE	MISC	RMKS
C187	DATE of visit	MISC	VIST
C193	DATE of QUAL water-quality measurement	MISC	QUAL
C217	DATE inspected -misc	MISC	COOP
C235	Water-level measurement DATE	WLEV	--
C236	DATE accuracy code -wl	WLEV	--
C303	DATE site record created	SITE	--
C321	Begin DATE for use of this measuring pt	CONS	MPNT
C322	End DATE for use of this measuring point	CONS	MPNT
C711	DATE site established/inventoried	SITE	--
C022	Altitude DATUM	SITE	--
C328	Altitude DATUM	CONS	MPNT
C036	Lat/long DATUM	SITE	--
C245	Water-level DATUM	WLEV	--
C909	Latitude NAD83 (decimal degrees)	SITE	--
C910	Longitude NAD83 (decimal degrees)	SITE	--
C205	Depth of DEEPEST well in group	MISC	SPEC
C027	Hole DEPTH	SITE	--
C028	DEPTH of well	SITE	--
C029	Source of DEPTH data	SITE	--
C044	DEPTH to intake	CONS	LIFT
C068	DEPTH to bottom of seal	CONS	CONS
C073	DEPTH to top of this interval	CONS	HOLE
C074	DEPTH to bottom of this interval	CONS	HOLE
C077	DEPTH to top of this casing string	CONS	CSNG
C078	DEPTH to bottom of this casing string	CONS	CSNG

Component Number	Description	File	Subfile
C083	DEPTH to top of this open interval	CONS	OPEN
C084	DEPTH to bottom of this open interval	CONS	OPEN
C091	DEPTH to top of interval	LOGS	GEOH
C092	DEPTH to bottom of interval	LOGS	GEOH
C200	DEPTH to top of logged interval	MISC	LOGS
C201	DEPTH to bottom of logged interval	MISC	LOGS
C205	DEPTH of deepest well in group	MISC	SPEC
C206	DEPTH of shallowest well in group	MISC	SPEC
C211	DEPTH of pond, tunnel, or drain	MISC	SPEC
C221	DEPTH of lateral in collector well	MISC	SPEC
C097	DESCRIPTION of material	LOGS	GEOH
C324	DESCRIPTION of this measuring point	CONS	MPNT
C069	Method of DEVELOPMENT	CONS	CONS
C070	Hours of DEVELOPMENT	CONS	CONS
C071	Special treatment during DEVELOPMENT	CONS	CONS
C075	DIAMETER of this interval	CONS	HOLE
C079	DIAMETER of this casing string	CONS	CSNG
C087	DIAMETER of this open interval	CONS	OPEN
C223	DIAMETER of lateral in collector well	MISC	SPEC
C262	DIAMETER of well group	MISC	SPEC
C112	DIFFUSIVITY	HYDR	COEF
C264	DIP of tunnel	MISC	SPEC
C148	Date DISCHARGE measured	DISC	--
C150	DISCHARGE	DISC	--
C151	Source of DISCHARGE data	DISC	--
C152	Method DISCHARGE measured	DISC	--
C157	Duration DISCHG before producing level	DISC	--
C175	Sphere of DISCHARGE	CONS	SPNG
C272	Specific capacity -DISCHARGE	DISC	--
C702	Last update -DISCHARGE	DISC	--
C703	DISCHARGE type	DISC	--
C807	Base DISCHARGE	SITE	--
C006	DISTRICT code	SITE	--
C811	Crest-stage DOWNSTREAM elevation	SITE	--
C801	DRAINAGE Basin Code	SITE	--
C808	DRAINAGE Area	SITE	--
C809	Contributing DRAINAGE area	SITE	--
C309	Water-level DRAWDOWN	DISC	--
C157	DURATION dischg before producing level	DISC	--
C271	Barometric EFFICIENCY	HYDR	COEF
C810	Crest-stage upstream ELEVATION	SITE	--
C811	Crest-stage downstream ELEVATION	SITE	--
C116	END year of data collection	MISC	NETW
C322	END date for use of this measuring point	CONS	MPNT
C711	Date site ESTABLISHED/inventoried	SITE	--
C712	Data avail in other Ground Water FILES	SITE	--
C066	Type of FINISH	CONS	CONS
C814	Local standard time FLAG	SITE	--
C804	FLAGS-type of data collected (30)	SITE	--
C805	FLAGS-instruments at site	SITE	--
C032	Record ready for Web FLAG	SITE	--
C850	Record ready for Web FLAG	CONS	--
C851	Record ready for Web FLAG	CONS	HOLE
C852	Record ready for Web FLAG	CONS	CSNG

Component Number	Description	File	Subfile
C853	Record ready for Web FLAG	CONS	OPEN
C854	Record ready for Web FLAG	CONS	LIFT
C855	Record ready for Web FLAG	CONS	REPR
C856	Record ready for Web FLAG	CONS	SPNG
C857	Record ready for Web FLAG	CONS	MPNT
C858	Record ready for Web FLAG	WLEV	--
C859	Record ready for Web FLAG	DISC	--
C860	Record ready for Web FLAG	MISC	OWNR
C861	Record ready for Web FLAG	MISC	OTID
C862	Record ready for Web FLAG	MISC	OTDT
C863	Record ready for Web FLAG	MISC	VIST
C864	Record ready for Web FLAG	MISC	QUAL
C865	Record ready for Web FLAG	MISC	LOGS
C866	Record ready for Web FLAG	MISC	NETW
C867	Record ready for Web FLAG	MISC	SPEC
C868	Record ready for Web FLAG	MISC	MSVL
C869	Record ready for Web FLAG	MISC	COOP
C870	Record ready for Web FLAG	MISC	RMKS
C871	Record ready for Web FLAG	GEOH	--
C872	Record ready for Web FLAG	GEOH	AQFR
C873	Record ready for Web FLAG	OBHD	--
C874	Record ready for Web FLAG	HYDR	--
C875	Record ready for Web FLAG	HYDR	COEF
C178	FLOW variability	CONS	SPNG
C179	Accuracy of FLOW variability	CONS	SPNG
C261	FORMAT of other data	MISC	OTDT
C118	FREQUENCY of data collection	MISC	NETW
C749	Last update for GEOH rec of GEOH file	LOGS	GEOH
C813	Mean GREENWICH time offset	SITE	--
C204	Number of wells/laterals in a GROUP	MISC	SPEC
C205	Depth of deepest well in GROUP	MISC	SPEC
C206	Depth of shallowest well in GROUP	MISC	SPEC
C207	Method wells in GROUP constructed	MISC	SPEC
C220	Number of wells/laterals in a GROUP	MISC	SPEC
C262	Diameter of well GROUP	MISC	SPEC
C270	Well HEADING line -obs	OBHD	--
C323	HEIGHT of this measuring point	CONS	MPNT
C027	HOLE depth	SITE	--
C757	Last update for HOLE rec of CONS file	CONS	HOLE
C108	HORIZONTAL conductivity	HYDR	COEF
C046	HORSEPOWER rating	CONS	LIFT
C057	HORSEPOWER of standby power source	CONS	LIFT
C070	HOURS of development	CONS	CONS
C745	Last update for HYDR rec of HYDR file	HYDR	HYDR
C100	HYDRAULIC unit id	HYDR	HYDR
C103	HYDRAULIC unit type	HYDR	HYDR
C104	HYDRAULIC remarks	HYDR	HYDR
C305	HYDRAULIC source agency	HYDR	HYDR
C020	HYDROLOGIC unit code	SITE	--
C001	Site ID (station number)	SITE	--
C100	Hydraulic unit ID	HYDR	HYDR
C213	Cooperators ID -misc	MISC	COOP
C176	IMPROVEMENTS	CONS	SPNG

Component Number	Description	File	Subfile
C217	Date INSPECTED -misc	MISC	COOP
C215	INSPECTION status -misc	MISC	COOP
C805	Flags-INSTRUMENTS at site	SITE	--
C044	Depth to INTAKE	CONS	LIFT
C073	Depth to top of this INTERVAL	CONS	HOLE
C074	Depth to bottom of this INTERVAL	CONS	HOLE
C075	Diameter of this INTERVAL	CONS	HOLE
C083	Depth to top of this open INTERVAL	CONS	OPEN
C084	Depth to bottom of this open INTERVAL	CONS	OPEN
C085	Type of openings in this INTERVAL	CONS	OPEN
C086	Material in this INTERVAL	CONS	OPEN
C087	Diameter of this open INTERVAL	CONS	OPEN
C091	Depth to top of INTERVAL	LOGS	GEOH
C092	Depth to bottom of INTERVAL	LOGS	GEOH
C101	Test INTERVAL -top	HYDR	HYDR
C102	Test INTERVAL -bottom	HYDR	HYDR
C200	Depth to top of logged INTERVAL	MISC	LOGS
C201	Depth to bottom of logged INTERVAL	MISC	LOGS
C711	Date site established/INVENTORIED	SITE	--
C016	Altitude of LAND surface	SITE	--
C013	LAND-NET location	SITE	--
C702	LAST update -discharge	DISC	--
C707	LAST update -obs	OBHD	--
C745	LAST update for HYDR rec of HYDR file	HYDR	HYDR
C747	LAST update for COEF rec of HYDR file	HYDR	COEF
C749	LAST update for GEOH rec of GEOH file	LOGS	GEOH
C751	LAST update for AQFR rec of GEOH file	LOGS	AQFR
C753	LAST update for LIFT rec of CONS file	CONS	LIFT
C755	LAST update for CONS rec of CONS file	CONS	CONS
C757	LAST update for HOLE rec of CONS file	CONS	HOLE
C759	LAST update for CSNG rec of CONS file	CONS	CSNG
C761	LAST update for OPEN rec of CONS file	CONS	OPEN
C763	LAST update for REPR rec of CONS file	CONS	REPR
C765	LAST update for SPNG rec of CONS file	CONS	SPNG
C767	LAST update for MPNT rec of CONS file	CONS	MPNT
C769	LAST update for OWNR rec of MISC file	MISC	OWNR
C771	LAST update for OTID rec of MISC file	MISC	OTID
C773	LAST update for OTDT rec of MISC file	MISC	OTDT
C775	LAST update for VIST rec of MISC file	MISC	VIST
C777	LAST update for QUAL rec of MISC file	MISC	QUAL
C779	LAST update for LOGS rec of MISC file	MISC	LOGS
C781	LAST update for NETW rec of MISC file	MISC	NETW
C783	LAST update for SPEC rec of MISC file	MISC	SPEC
C785	LAST update for MSVL rec of MISC file	MISC	MSVL
C787	LAST update for COOP rec of MISC file	MISC	COOP
C789	LAST update for RMKS rec of MISC file	MISC	RMKS
C011	LAT-LONG accuracy code	SITE	--
C035	Method LAT/LONG determined	SITE	--
C036	LAT/LONG datum	SITE	--
C221	Depth of LATERAL in collector well	MISC	SPEC
C222	Length of LATERAL in collector well	MISC	SPEC
C223	Diameter of LATERAL in collector well	MISC	SPEC
C224	Mesh of screen in LATERAL	MISC	SPEC
C009	LATITUDE	SITE	--

Component Number	Description	File	Subfile
C909	LATITUDE NAD83(decimal degrees)	SITE	[U1] --
C111	LEAKANCE	HYDR	COEF
C089	LENGTH of openings	CONS	OPEN
C209	LENGTH of pond, tunnel, or drain	MISC	SPEC
C222	LENGTH of lateral in collector well	MISC	SPEC
C126	Aquifer-static-LEVEL	LOGS	AQFR
C153	Production LEVEL	DISC	--
C154	Static water LEVEL	DISC	--
C155	Source of water-LEVEL data	DISC	--
C156	Method water LEVEL measured	DISC	--
C157	Duration discharge before producing LEVEL	DISC	--
C235	Water-LEVEL measurement date	WLEV	--
C236	Date accuracy code -water level	WLEV	--
C237	Water LEVEL below LSD	WLEV	--
C242	Water LEVEL referenced to Vertical Datum	WLEV	--
C243	Water LEVEL referenced to code	WLEV	--
C244	Source of water LEVEL	WLEV	--
C245	Water-LEVEL datum	WLEV	--
C238	Water-LEVEL status	WLEV	--
C239	Water-LEVEL method	WLEV	--
C240	Water-LEVEL reference code	WLEV	--
C309	Water-LEVEL drawdown	DISC	--
C246	ID of party making water-LEVEL measurement	WLEV	--
C038	Date LIFT data collected	CONS	LIFT
C043	Type of LIFT	CONS	LIFT
C048	Manufacturer of LIFT device	CONS	LIFT
C049	Serial number of LIFT device	CONS	LIFT
C054	Company that maintains LIFT device	CONS	LIFT
C255	Additional LIFT (above land surface)	CONS	LIFT
C268	Rated capacity of the LIFT device	CONS	LIFT
C753	Last update for LIFT subrecord	CONS	LIFT
C096	LITHOLOGY code	LOGS	GEOH
C012	LOCAL well number	SITE	--
C814	LOCAL standard time flag	SITE	--
C013	Land-net LOCATION	SITE	--
C014	Name of LOCATION map	SITE	--
C015	Scale of LOCATION map	SITE	--
C815	Station LOCATOR sequence number	SITE	--
C199	Type of LOG	MISC	LOGS
C202	Source of LOG data	MISC	LOGS
C200	Depth to top of LOGGED interval	MISC	LOGS
C201	Depth to bottom of LOGGED interval	MISC	LOGS
C779	Last update for LOGS rec of MISC file	MISC	LOGS
C010	Longitude	SITE	--
C910	LONGITUDE NAD83 (decimal degrees)	SITE	--
C054	Company that MAINTAINS lift device	CONS	LIFT
C048	MANUFACTURER of lift device	CONS	LIFT
C014	Name of location MAP	SITE	--
C015	Scale of location MAP	SITE	--
C080	Casing MATERIAL	CONS	CSNG
C086	MATERIAL in this interval	CONS	OPEN
C097	Description of MATERIAL	LOGS	GEOH
C235	Water-level MEASUREMENT date	WLEV	--
C709	MEASUREMENT time -water level	WLEV	--

Component Number	Description	File	Subfile
C321	Begin date for use of this MEASURING point	CONS	MPNT
C322	End date for use of this MEASURING point	CONS	MPNT
C323	Height of this MEASURING point	CONS	MPNT
C324	Description of this MEASURING point	CONS	MPNT
C325	Altitude of MEASURING point	CONS	MPNT
C224	MESH of screen in lateral	MISC	SPEC
C052	Power-METER number	CONS	LIFT
C017	METHOD altitude determined	SITE	--
C325	METHOD altitude determined	CONS	MPNT
C065	METHOD of construction	CONS	CONS
C069	METHOD of development	CONS	CONS
C133	METHOD of data collection	MISC	NETW
C152	METHOD discharge measured	DISC	--
C035	METHOD lat/long determined	SITE	--
C156	METHOD water level measured	DISC	--
C207	METHOD wells in group constructed	MISC	SPEC
C239	Water-level METHOD	WLEV	--
C185	Remarks -MISC	MISC	RMKS
C213	Cooperators id -MISC	MISC	COOP
C214	Contractors -MISC	MISC	COOP
C215	Inspection status -MISC	MISC	COOP
C216	Reason unapproved -MISC	MISC	COOP
C217	Date inspected -MISC	MISC	COOP
C251	Value-1 -MISC	MISC	MSVL
C252	Value-2 -MISC	MISC	MSVL
C253	Value-3 -MISC	MISC	MSVL
C314	Value-4 -MISC	MISC	MSVL
C708	Network secondary - MISC	MISC	NETW
C706	Network data type - MISCELLANEOUS	MISC	NETW
C767	Last update for MPNT rec of CONS file	CONS	MPNT
C785	Last update for MSVL rec of MISC file	MISC	MSVL
C014	NAME of location map	SITE	--
C050	NAME of power company	CONS	LIFT
C063	NAME of contractor	CONS	CONS
C169	NAME of contractor who made repairs	CONS	REPR
C172	NAME of spring	CONS	SPNG
C900	Station NAME	SITE	--
C715	National Aquifer code	SITE	--
C781	Last update for NETW rec of MISC file	MISC	NETW
C117	Source agency for NETWORK data	MISC	NETW
C120	Type of analyses - QW NETWORK	MISC	NETW
C257	Primary NETWORK	MISC	NETW
C706	NETWORK data type - miscellaneous	MISC	NETW
C708	NETWORK secondary - miscellaneous	MISC	NETW
C204	NUMBER of wells/laterals in a group	MISC	SPEC
C220	NUMBER of wells/laterals in a group	MISC	SPEC
C815	Station locator sequence NUMBER	SITE	--
C270	Well heading line -OBS	OBHD	--
C707	Last update -OBS	OBHD	--
C813	Mean Greenwich time OFFSET	SITE	--
C083	Depth to top of this OPEN interval	CONS	OPEN
C084	Depth to bottom of this OPEN interval	CONS	OPEN
C087	Diameter of this OPEN interval	CONS	OPEN
C761	Last update for OPEN rec of CONS file	CONS	OPEN

Component Number	Description	File	Subfile
C085	Type of OPENINGS in this interval	CONS	OPEN
C088	Width of OPENINGS	CONS	OPEN
C089	Length of OPENINGS	CONS	OPEN
C773	Last update for OTDT rec of MISC file	MISC	OTDT
C181	OTHER data type	MISC	OTDT
C182	OTHER data location	MISC	OTDT
C190	OTHER identifier	MISC	OTID
C191	Assignor of OTHER identifier	MISC	OTID
C261	Format of OTHER data	MISC	OTDT
C712	Data avail in OTHER Ground Water files	SITE	--
C771	Last update for OTID rec of MISC file	MISC	OTID
C161	OWNER Name	MISC	OWNR
C360	OWNER Alias Name	MISC	OWNR
C351	OWNER Phone Number	MISC	OWNR
C352	Access to Owner Name	MISC	OWNR
C353	OWNER Address Line 1	MISC	OWNR
C354	OWNER Address Line 2	MISC	OWNR
C355	OWNER City Name	MISC	OWNR
C356	OWNER Postal Code	MISC	OWNR
C357	OWNER Zip Code	MISC	OWNR
C358	OWNER Country Code	MISC	OWNR
C357	Access to OWNER Phone/Address	MISC	OWNR
C159	Date of OWNERSHIP	MISC	OWNR
C769	Last update for OWNR rec of MISC file	MISC	OWNR
C196	Water-quality PARAMETER code	MISC	QUAL
C197	Value of water-quality PARAMETER	MISC	QUAL
C901	PARENT seq num for CSNG rec of CONS file	CONS	CSNG
C059	PARENT seq num for HOLE rec of CONS file	CONS	HOLE
C902	PARENT seq num for OPEN rec of CONS file	CONS	OPEN
C099	PARENT sequence number - hydr	HYDR	HYDR
C256	PARENT sequence number for AQFR rec	LOGS	AQFR
C170	Percent change in PERFORMANCE after repairs	CONS	REPR
C174	PERMANENCE of spring	CONS	SPNG
C246	ID of PARTY making water-level measurement	WLEV	--
C061	User ID of PERSON creating record	SITE	--
C403	User ID of PERSON creating record	CONS	--
C406	User ID of PERSON creating record	CONS	HOLE
C409	User ID of PERSON creating record	CONS	CSNG
C412	User ID of PERSON creating record	CONS	OPEN
C415	User ID of PERSON creating record	CONS	LIFT
C418	User ID of PERSON creating record	CONS	REPR
C421	User ID of PERSON creating record	CONS	SPNG
C424	User ID of PERSON creating record	CONS	MPNT
C427	User ID of PERSON creating record	WLEV	--
C430	User ID of PERSON creating record	DISC	--
C433	User ID of PERSON creating record	MISC	OWNR
C436	User ID of PERSON creating record	MISC	OTID
C439	User ID of PERSON creating record	MISC	OTDT
C442	User ID of PERSON creating record	MISC	VIST
C445	User ID of PERSON creating record	MISC	QUAL
C448	User ID of PERSON creating record	MISC	LOGS
C451	User ID of PERSON creating record	MISC	NETW
C454	User ID of PERSON creating record	MISC	SPEC
C457	User ID of PERSON creating record	MISC	MSVL

Component Number	Description	File	Subfile
C460	User ID of PERSON creating record	MISC	COOP
C463	User ID of PERSON creating record	MISC	RMKS
C466	User ID of PERSON creating record	LOGS	GEOH
C469	User ID of PERSON creating record	LOGS	AQFR
C472	User ID of PERSON creating record	OBHD	--
C475	User ID of PERSON creating record	HYDR	HYDR
C478	User ID of PERSON creating record	HYDR	COEF
C062	User ID of PERSON updating record	SITE	--
C405	User ID of PERSON updating record	CONS	--
C408	User ID of PERSON updating record	CONS	HOLE
C411	User ID of PERSON updating record	CONS	CSNG
C414	User ID of PERSON updating record	CONS	OPEN
C417	User ID of PERSON updating record	CONS	LIFT
C420	User ID of PERSON updating record	CONS	REPR
C423	User ID of PERSON updating record	CONS	SPNG
C426	User ID of PERSON updating record	CONS	MPNT
C429	User ID of PERSON updating water-level record	WLEV	--
C432	User ID of PERSON updating discharge record	DISC	--
C435	User ID of PERSON updating record	MISC	OWNR
C438	User ID of PERSON updating record	MISC	OTID
C441	User ID of PERSON updating record	MISC	OTDT
C444	User ID of PERSON updating record	MISC	VIST
C447	User ID of PERSON updating record	MISC	QUAL
C448	User ID of PERSON updating record	MISC	LOGS
C453	User ID of PERSON updating record	MISC	NETW
C456	User ID of PERSON updating record	MISC	SPEC
C459	User ID of PERSON updating record	MISC	MSVL
C462	User ID of PERSON updating record	MISC	COOP
C465	User ID of PERSON updating record	MISC	RMKS
C468	User ID of PERSON updating record	GEOH	--
C471	User ID of PERSON updating record	GEOH	AQFR
C474	User ID of PERSON updating record	OBHD	--
C477	User ID of PERSON updating record	HYDR	--
C480	User ID of PERSON updating record	HYDR	COEF
C188	PERSON who made visit	MISC	VIST
C306	POROSITY	HYDR	COEF
C045	Type of POWER	CONS	LIFT
C050	Name of POWER company	CONS	LIFT
C051	POWER-company account number	CONS	LIFT
C052	POWER-meter number	CONS	LIFT
C053	POWER-consumption coefficient	CONS	LIFT
C056	Type of standby POWER	CONS	LIFT
C057	Horsepower of standby POWER source	CONS	LIFT
C023	PRIMARY use of site	SITE	--
C024	PRIMARY use of water	SITE	--
C257	PRIMARY network	MISC	NETW
C153	PRODUCTION level	DISC	--
C005	PROJECT number	SITE	--
C777	Last update for QUAL rec of MISC file	MISC	QUAL
C193	Date of QUAL water-quality measurement	MISC	QUAL
C195	Aquifer sampled	MISC	QUAL
C196	Water-QUALITY parameter code	MISC	QUAL
C197	Value of water-QUALITY parameter	MISC	QUAL

Component Number	Description	File	Subfile
C120	Type of analyses - QW network	MISC	NETW
C268	RATED capacity of the lift device	CONS	LIFT
C046	Horsepower RATING	CONS	LIFT
C216	REASON unapproved -misc	MISC	COOP
C165	RECORD number for repairs subrecord	CONS	REPR
C254	RECORD number for lift subrecord	CONS	LIFT
C723	RECORD number for construction subrecord	CONS	CONS
C724	RECORD number for hole subrecord	CONS	HOLE
C725	RECORD number for casing subrecord	CONS	CSNG
C726	RECORD number for openings subrecord	CONS	OPEN
C727	RECORD number for spring subrecord	CONS	SPNG
C728	RECORD number for meas. point subrecord	CONS	MPNT
C744	RECORD type for HYDR record	HYDR	--
C746	RECORD type for COEF rec of HYDR file	HYDR	COEF
C748	RECORD type for GEOH rec of GEOH file	LOGS	GEOH
C750	RECORD type for AQFR rec of GEOH file	LOGS	AQFR
C752	RECORD type for LIFT rec of CONS file	CONS	LIFT
C754	RECORD type for CONS rec of CONS file	CONS	CONS
C756	RECORD type for HOLE rec of CONS file	CONS	HOLE
C758	RECORD type for CSNG rec of CONS file	CONS	CSNG
C760	RECORD type for OPEN rec of CONS file	CONS	OPEN
C762	RECORD type for REPR rec of CONS file	CONS	REPR
C764	RECORD type for SPNG rec of CONS file	CONS	SPNG
C766	RECORD type for MPNT rec of CONS file	CONS	MPNT
C768	RECORD type for OWNR rec of MISC file	MISC	OWNR
C770	RECORD type for OTID rec of MISC file	MISC	OTID
C772	RECORD type for OTDT rec of MISC file	MISC	OTDT
C774	RECORD type for VIST rec of MISC file	MISC	VIST
C776	RECORD type for QUAL rec of MISC file	MISC	QUAL
C778	RECORD type for LOGS rec of MISC file	MISC	LOGS
C780	RECORD type for NETW rec of MISC file	MISC	NETW
C782	RECORD type for SPEC rec of MISC file	MISC	SPEC
C784	RECORD type for MSVL rec of MISC file	MISC	MSVL
C786	RECORD type for COOP rec of MISC file	MISC	COOP
C788	RECORD type for RMKS rec of CONS file	MISC	RMKS
C240	Water-level REFERENCE code	WLEV	--
C003	Data RELIABILITY	SITE	--
C184	REMARK-date	MISC	RMKS
C806	Station REMARK fields	SITE	--
C104	Hydraulic REMARKS	HYDR	HYDR
C185	REMARKS -misc	MISC	RMKS
C218	Cooperators REMARKS	MISC	COOP
C166	Nature of REPAIRS	CONS	REPR
C167	Date of REPAIRS	CONS	REPR
C169	Name of contractor who made REPAIRS	CONS	REPR
C170	Pct change in performance after REPAIRS	CONS	REPR
C763	Last update for REPR rec of CONS file	CONS	REPR
C789	Last update for RMKS rec of MISC file	MISC	RMKS
C307	Agency that analyzes SAMPLES	MISC	NETW
C015	SCALE of location map	SITE	--
C224	Mesh of SCREEN in lateral	MISC	SPEC
C067	Type of surface SEAL	CONS	CONS
C068	Depth to bottom of SEAL	CONS	CONS
C025	SECONDARY use of water	SITE	--

Component Number	Description	File	Subfile
C301	SECONDARY use of site	SITE	--
C708	Network SECONDARY -misc	MISC	NETW
C106	SEQ number for COEF rec of HYDR file	HYDR	COEF
C311	SEQ number for RMKS rec of MISC file	MISC	RMKS
C312	SEQ number for OTDT rec of MISC file	MISC	OTDT
C313	SEQ number for MSVL rec of MISC file	MISC	MSVL
C718	SEQ number for OWNR rec of MISC file	MISC	OWNR
C721	SEQ number for GEOH rec of GEOH file	LOGS	GEOH
C729	SEQ number for SPEC rec of MISC file	MISC	SPEC
C730	SEQ number for SPEC rec of MISC file	MISC	NETW
C734	SEQ number for COOP rec of MISC file	MISC	COOP
C736	SEQ number for OTID rec of MISC file	MISC	OTID
C737	SEQ number for VIST rec of MISC file	MISC	VIST
C738	SEQ number for QUAL rec of MISC file	MISC	QUAL
C739	SEQ number for LOGS rec of MISC file	MISC	LOGS
C742	SEQ number for AQFR rec of GEOH file	LOGS	AQFR
C742	SEQ number for AQFR rec of GEOH file	LOGS	AQFR
C743	SEQ number for COEF rec of HYDR file	HYDR	COEF
C790	SEQ number for HYDR rec of HYDR file	HYDR	HYDR
C147	Record SEQUENCE number	DISC	--
C315	SEQUENCE number -obs	OBHD	--
C815	Station locator SEQUENCE number	SITE	--
C049	SERIAL number of lift device	CONS	LIFT
C206	Depth of SHALLOWEST well in group	MISC	SPEC
C001	SITE ID (station number)	SITE	--
C802	SITE-type codes	SITE	--
C040	Date SITE record last updated	SITE	--
C004	SOURCE agency code	SITE	--
C029	SOURCE of depth data	SITE	--
C064	SOURCE of construction data	CONS	CONS
C117	SOURCE agency for network data	MISC	NETW
C151	SOURCE of discharge data	DISC	--
C155	SOURCE of water-level data	DISC	--
C202	SOURCE of log data	MISC	LOGS
C305	Hydraulic SOURCE agency	HYDR	HYDR
C783	Last update for SPEC rec of MISC file	MISC	SPEC
C071	SPECIAL treatment during development	CONS	CONS
C113	SPECIFIC storage	HYDR	COEF
C272	SPECIFIC capacity -discharge	DISC	--
C175	SPHERE of discharge	CONS	SPNG
C765	Last update for SPNG rec of CONS file	CONS	SPNG
C172	Name of SPRING	CONS	SPNG
C173	Type of SPRING	CONS	SPNG
C174	Permanence of SPRING	CONS	SPNG
C177	Number of SPRING openings	CONS	SPNG
C814	Local STANDARD time flag	SITE	--
C056	Type of STANDBY power	CONS	LIFT
C057	Horsepower of STANDBY power source	CONS	LIFT
C007	STATE code	SITE	--
C126	Aquifer-STATIC-level	LOGS	AQFR
C154	STATIC water level	DISC	--
C001	Site ID (STATION number)	SITE	--
C815	STATION locator sequence number	SITE	--
C900	STATION name	SITE	--

Component Number	Description	File	Subfile
C215	Inspection STATUS -misc	MISC	COOP
C238	Water-level STATUS	WLEV	--
C110	STORAGE coefficient	HYDR	COEF
C113	Specific STORAGE	HYDR	COEF
C016	Altitude of land SURFACE	SITE	--
C067	Type of SURFACE seal	CONS	CONS
C026	TERTIARY use of water	SITE	--
C302	TERTIARY use of site	SITE	--
C101	TEST interval -top	HYDR	HYDR
C102	TEST interval -bottom	HYDR	HYDR
C081	Wall THICKNESS of this casing	CONS	CSNG
C709	Measurement TIME -water level	WLEV	--
C813	Mean Greenwich TIME offset	SITE	--
C814	Local standard TIME flag	SITE	--
C073	Depth to TOP of this interval	CONS	HOLE
C077	Depth to TOP of this casing string	CONS	CSNG
C083	Depth to TOP of this open interval	CONS	OPEN
C091	Depth to TOP of interval	LOGS	GEOH
C101	Test interval -TOP	HYDR	HYDR
C200	Depth to TOP of logged interval	MISC	LOGS
C019	TOPOGRAPHIC setting	SITE	--
C107	TRANSMISSIVITY	HYDR	COEF
C071	Special TREATMENT during development	CONS	CONS
C264	Dip of TUNNEL	MISC	SPEC
C043	TYPE of lift	CONS	LIFT
C045	TYPE of power	CONS	LIFT
C056	TYPE of standby power	CONS	LIFT
C066	TYPE of finish	CONS	CONS
C067	TYPE of surface seal	CONS	CONS
C085	TYPE of openings in this interval	CONS	OPEN
C103	Hydraulic unit TYPE	HYDR	HYDR
C120	TYPE of analyses - QW network	MISC	NETW
C173	TYPE of spring	CONS	SPNG
C199	TYPE of log	MISC	LOGS
C703	Discharge TYPE	DISC	--
C706	Network data TYPE -miscellaneous	MISC	NETW
C713	Aquifer-TYPE code	SITE	--
C802	SITE-type codes	SITE	--
C804	Flags-TYPE of data collected (30)	SITE	--
C216	Reason UNAPPROVED -misc	MISC	COOP
C020	Hydrologic UNIT code	SITE	--
C100	Hydraulic UNIT id	HYDR	HYDR
C103	Hydraulic UNIT type	HYDR	HYDR
C304	Contributing UNIT	LOGS	GEOH
C702	Last UPDATE -discharge	DISC	--
C707	Last UPDATE -obs	OBHD	--
C061	USER ID of person creating record	SITE	--
C062	USER ID of person updating record	SITE	--
C745	Last UPDATE for HYDR rec of HYDR file	HYDR	HYDR
C747	Last UPDATE for COEF rec of HYDR file	HYDR	COEF
C749	Last UPDATE for GEOH rec of GEOH file	LOGS	GEOH
C751	Last UPDATE for AQFR rec of GEOH file	LOGS	AQFR
C753	Last UPDATE for LIFT rec of CONS file	CONS	LIFT
C755	Last UPDATE for CONS rec of CONS file	CONS	CONS

Component Number	Description	File	Subfile
C757	Last UPDATE for HOLE rec of CONS file	CONS	HOLE
C759	Last UPDATE for CSNG rec of CONS file	CONS	CSNG
C761	Last UPDATE for OPEN rec of CONS file	CONS	OPEN
C763	Last UPDATE for REPR rec of CONS file	CONS	REPR
C765	Last UPDATE for SPNG rec of CONS file	CONS	SPNG
C767	Last UPDATE for MPNT rec of CONS file	CONS	MPNT
C769	Last UPDATE for OWNR rec of MISC file	MISC	OWNR
C771	Last UPDATE for OTID rec of MISC file	MISC	OTID
C773	Last UPDATE for OTDT rec of MISC file	MISC	OTDT
C775	Last UPDATE for VIST rec of MISC file	MISC	VIST
C777	Last UPDATE for QUAL rec of MISC file	MISC	QUAL
C779	Last UPDATE for LOGS rec of MISC file	MISC	LOGS
C781	Last UPDATE for NETW rec of MISC file	MISC	NETW
C783	Last UPDATE for SPEC rec of MISC file	MISC	SPEC
C785	Last UPDATE for MSVL rec of MISC file	MISC	MSVL
C787	Last UPDATE for COOP rec of MISC file	MISC	COOP
C789	Last UPDATE for RMKS rec of MISC file	MISC	RMKS
C040	Date site record last UPDATED	SITE	--
C810	Crest-stage UPSTREAM elevation	SITE	--
C023	Primary USE of site	SITE	--
C024	Primary USE of water	SITE	--
C025	Secondary USE of water	SITE	--
C026	Tertiary USE of water	SITE	--
C301	Secondary USE of site	SITE	--
C302	Tertiary USE of site	SITE	--
C803	Agency USE of site code	SITE	--
C197	VALUE of water-quality parameter	MISC	QUAL
C251	VALUE-1 -misc	MISC	MSVL
C252	VALUE-2 -misc	MISC	MSVL
C253	VALUE-3 -misc	MISC	MSVL
C314	VALUE-4 -misc	MISC	MSVL
C178	Flow VARIABILITY	CONS	SPNG
C179	Accuracy of flow VARIABILITY	CONS	SPNG
C109	VERTICAL conductivity	HYDR	COEF
C187	Date of VISIT	MISC	VIST
C188	Person who made VISIT	MISC	VIST
C775	Last update for VIST rec of MISC file	MISC	VIST
C081	WALL thickness of this casing	CONS	CSNG
C024	Primary use of WATER	SITE	--
C025	Secondary use of WATER	SITE	--
C026	Tertiary use of WATER	SITE	--
C154	Static WATER level	DISC	--
C155	Source of WATER-level data	DISC	--
C156	Method WATER level measured	DISC	--
C193	Date of QUAL water-quality measurement	MISC	QUAL
C196	WATER-quality parameter code	MISC	QUAL
C197	Value of WATER-quality parameter	MISC	QUAL
C235	WATER-level measurement date	WLEV	--
C236	Date accuracy code -water level	WLEV	--
C237	WATER level below LSD	WLEV	--
C238	WATER-level status	WLEV	--
C239	WATER-level method	WLEV	--
C240	WATER-level reference code	WLEV	--
C242	WATER level referenced to Vertical Datum	WLEV	--

Component Number	Description	File	Subfile
C243	WATER level referenced to code	WLEV	--
C244	Source of WATER level	WLEV	--
C245	WATER-level datum	WLEV	--
C309	WATER-level drawdown	DISC	--
C246	WATER-level party making measurement	WLEV	--
C039	National WATER USE code	SITE	--
C032	Record ready for WEB flag	SITE	--
C012	Local WELL number	SITE	--
C088	WIDTH of openings	CONS	OPEN
C210	WIDTH of pond, tunnel, or drain	MISC	SPEC
C115	Begin YEAR of data collection	MISC	NETW
C116	End YEAR of data collection	MISC	NETW

9 GROUND-WATER HYDROGRAPH PROGRAM

by Leslie W. Lenfest, Jr.

The Ground-Water Hydrograph program produces hydrographs using water-level data stored in GWSI. The hydrograph program currently uses the TKG2 graphics software.

9.1 Introduction

The Ground-Water Hydrograph program generates hydrographs of water-level data for selected sites specified in an input file. The input file may be created outside the hydrograph program using an editor, from a GWSI water-level retrieval, or generated from within the hydrograph program using Option **E** from the hydrograph menu. One or two hydrographs per page may be displayed on the user's terminal or sent to a designated printer; hydrograph format specifications are entered in response to prompts while running the program. The file containing the list of sites is in the following format:

```

USGS 383838104282801
USGS 363636107121201
      .
      .
      .
USGS 350202105444402
    
```

USGS or other agency codes are entered in columns 1 through 5, and the site ID is entered, left-justified, in columns 6 through 20.

9.2 Program Operation

Select **Option 16: Plot Hydrographs from the GWSI Main Menu**. The program displays the following:

```

*****
*           HYDROGRAPH PROGRAM VERSION NWIS_ [yyyymmdd]
*
*  WARNING: To generate data for the hydrographs, you need a file
*           containing site id's. See option E.
*****
  C = Continue. (Create a GWSI hydrograph.)
  E = Display an example of a file containing siteid's, with an
option
      to create or edit a file.

  L = List the current directory
  Q = Quit the program.

Enter C, E, L, or Q:
    
```

The Hydrograph program requires an input file containing a list of sites. Select **C** if you have a file that contains a list of sites ready. Select **E** if you do not have a file that contains a list of sites, but wish to create one. When **E** is selected, the program will display an example and prompt the user whether a file should be created; if the user replies with a **Y**, the user's default editor will be initiated, and the desired site(s) may be entered. If the user types **N**, the initial hydrograph menu will be displayed. Select **L** if you wish to display the contents of the working directory to search for an existing input file. Select **Q** to exit the Hydrograph program.

To begin processing one or more hydrographs, type **C**; the program prompts the user for the name of the file that contains the list of sites. After the program verifies that the file exists, it prompts for GWSI retrieval restrictions. The next prompt asks for information that will specify the format of the data to be plotted on the hydrograph:

BEGINNING DATE: The default for the beginning date is 10/01/1900. This date may be changed.

ENDING DATE: The default for the ending date is the current date. This date may be changed, but a date later than the current date may not be specified.

WATER-LEVEL TYPE: Specify the type of water-level data that is to be plotted. The current water-level types include:

- LSD - Depth below Land Surface Datum (**Default**)
- MP - Depth below Measuring Point
- S - Water levels referenced to vertical datum

The water-level type specified pertains to **ALL** sites in the input file. Only the water levels that are the specific type chosen will be plotted. If other water-level types should be plotted, they will need to be converted to water-level type specified. See the **WATER-LEVEL CONVERSION**: section below. Computed water levels of other water-level types will automatically be included in the tabled results in the specified format. The type of water level will be displayed in the heading of the table of water levels.

DATUM: Specify the datum to which the water levels are to be plotted. Conversions are generally available within the lower 48 states and are provided by the North American Datum Conversion. The datums currently supported by NWIS are:

- NGVD1929 (**Default**)
- NAVD1988

The Datum will be displayed on the right vertical scale of the hydrograph. The datum will also be displayed in the water-level table if specified. Datum will be displayed next to the site altitude in the table heading, if available, and in the table heading for water levels referenced to vertical datum.

WATER-LEVEL CONVERSION: Specify whether or not to convert water levels to the specified water-level type. No conversion, option 1, will only display those water

levels stored as the water-level type specified. Conversion, option 2, will display all water-level types converted to the water-level type specified.

WATER-LEVEL STATUS CODES: Specify whether water-level records with status codes are to be plotted. Historically, water levels with status populated were not plotted on hydrographs. The default is 'N': do not plot water levels with status code. Once these specifications have been entered, the program retrieves water levels for those sites specified in the input file. **Note: there is no notification that a site does not contain water-level data.**

Once the water-level data have been retrieved, the program prompts the user for specifications that will determine the appearance of the hydrograph(s) on the screen and/or at the printer:

NUMBER OF PLOTS PER FRAME: Hydrographs may be plotted individually on one or two graphs per screen, or two hydrographs may be plotted on one graph per screen. The user is prompted for plotting specifications as shown below:

One or two plots per frame, or two traces on one plot (3).
Enter 1-3. <cr>=2:

If the user selects option 1, one plot containing one hydrograph will be displayed on the screen, or sheet if output to a printer. If the user selects option 2 (default) or hits the carriage return <CR>, two plots containing one hydrograph per plot will be displayed on the screen, or sheet if output to a printer. Hydrographs will be displayed in the order found in the input file.

If the user selects option 3, two hydrographs will be displayed on one plot per screen or page (depending on the destination of the output). The hydrographs will be identified by two different symbols, as long as symbols have not been toggled off at the prompt "Do you want this symbol drawn?" Hydrographs will be displayed in the order found in the input file, **by twos**. Sites 1 and 2, 3 and 4, 5 and 6, etc., will be plotted in pairs in the order found in the input file.

PLOT FORMAT: The graph can appear in several different forms. **Note: The default settings should be used if the multiple hydrograph on one plot (see Number of plots per frame) is selected.**

The program first prompts the user whether symbols for each point should be plotted; the default for this prompt is 'Y'. If the user selects 'N', symbols will not be plotted on the graph.

If symbols are specified, the program next prompts the user for the appearance of the symbol. The default is a cross (+). If the user wishes to specify a different symbol, 'Y' should be typed at the prompt and an alternate symbol selected from the displayed menu of symbols. If the user specified no symbols, this prompt is skipped.

The program next prompts the user if the symbols are to be connected; the default for this prompt is 'Y'. If the user specified no symbols, the points are automatically connected.

DESTINATION OF PLOT: The hydrographs may be sent to a user-designated printer or it may be displayed on the user's monitor (default).

VERTICAL SCALE: The vertical scale is automatically set by the graphics program to allow sufficient room for the range of water-level data to be plotted. The format of the scales differ according to the type of water level that is plotted:

- LSD
 - Left Scale displays water level in feet below land surface datum.
 - Right Scale displays water-level altitude, IF altitude of land surface is available at the site.
- MP
 - Left and Right Scales display depth below measuring point.
- S
 - Left and Right Scales display water-level altitude.

Altitude scales will be displayed either in NGVD29 (default) or NAVD88 vertical datum according to what was specified in DATUM. The scale description will indicate the datum used.

HORIZONTAL SCALE: The date scale can be displayed in two formats:

- **Option 1:** Auto (default) plots EACH hydrograph to a horizontal scale that will conform to the retrieved data available for each individual site.
- **Option 2:** specifies a range of dates that will accommodate the range of dates for all sites; the scale for all plotted hydrographs will be the same on all screens. This specification is useful when comparisons between plotted hydrographs are desired.

Once the specifications are complete, the plot will be sent to the designated printer, or displayed on the user's monitor. If the plot is directed to the user-designated printer, all plots will go directly to the printer; hydrographs will not be displayed on the monitor screen. After the last hydrograph has been displayed on-screen or sent to the printer, the program will allow the user to create, print, and save a table of all available water levels for the specified sites.

If the plot is directed to the user's monitor, the hydrograph(s) will appear on screens on the monitor, with one or two hydrographs per screen, depending on the input specifications. Control of the screen and some limited modifications to the image can be applied using the buttons that appear on the upper left border of the hydrograph. For a complete explanation about Tkg2, please refer to documentation on the Tkg2 website found at:

<http://tx.cr.usgs.gov/tkg2/>

Useful Tkg2 menu options:

FILE pull-down menu:

- **Print (postscript)** – Use this option to print displayed hydrograph without exiting.
- **Print and Exit** – Use this option to print displayed hydrograph and exit from the screen displayed on the monitor and proceed to the next hydrograph screen or continue processing.
- **Exit Tkg2** – Use this option to exit from the screen and proceed to the next hydrograph screen or continue processing.

GLOBAL SETTINGS pull-down menu:

- **Edit some global settings** – Use this option to rescale the fonts if the scale headings are difficult to read.

To view successive hydrographs, the user needs to EXIT Tkg2, using options found on the FILE pull-down menu.

Once all of the hydrographs have been displayed either on the printer or monitor, and tabling specifications have been completed, the user is returned to the hydrograph menu. New hydrograph specifications may be entered or the process ended by quitting the hydrograph program.

9.3 Summary

A review of the hydrograph procedure is as follows:

1. Select Option 16: Plot Hydrographs from the GWSI Main Menu.
2. Enter the name of the file containing the sites for retrieval.
3. OR, create a list of sites, Agency Code and site ID, at Option **E**.
4. Enter beginning and ending hydrograph dates.
5. Enter hydrograph plot characteristics.
6. Display hydrograph(s) either at designated printer or monitor.
7. Enter water-level table specifications.
8. Return to GWSI Main Menu.

Entire sites or data values within a site, which meet the default restriction criteria as documented in [Section 8.2.4](#), will be excluded from the retrieval. Restrictions are based on the Web Flag, which in turn is controlled by whether or not the data is proprietary, local use, and has passed data checks. The default is A) Exclude Sites/Data Restricted From The Web. There is no current option to change these restriction criteria.

10 GENERATE FIELD FORMS

by Leslie W. Lenfest, Jr.

The Ground-Water Site-Inventory Field Forms program generates a flexible-format field form that can be output to a printer, taken to the field, and used by field personnel to record ground-water data.

10.1 Introduction

The Ground-Water Site-Inventory Field Forms program generates a flexible-format field form that can be used by field personnel to record ground-water data. The Field Forms program has the following properties:

- Forms for new or existing sites may be prepared:
 - ✓ Forms for new sites contain blanks for all selected components.
 - ✓ Forms for existing sites will pre-populate selected Sitefile components where data exist to provide information about the site to field personnel.
- Field forms can be set up to contain user-specified components in any of a number of different formats.
- Component selection is performed in a similar manner to the preparation of prompt lists for the Query and Screen Entry programs.
- Field Form specification files are set up by prompting the user for desired components; default for prompts is yes **Y**.
- Multiple blank fields for non-sitefile record types may be specified.
- Query or Screen Entry prompt lists may be used by the Field Forms program to specify component selection.
- If Query or Screen Entry prompt lists are used, the user cannot specify multiple iterations of records displayed on form.
- Specifications for one or more Field Form formats can be saved and reused.
- Site selection can be specified in several different ways:
 - ✓ Sites may be entered separately from the user's terminal.
 - ✓ A list of sites may be used to generate field forms.
 - ✓ No sites entered will result in blank forms that can be used to inventory new sites.

10.2 Program Operation

The Field Form program may be selected from the GWSI Main Menu by using Option 11. The program identifies itself as FLDFORM and initiates a series of prompts that will result in the generation of field forms. The first prompt is:

Do you want to generate a field form?

If the answer is no, the program is terminated. If yes, the program continues.

10.2.1 Selection of Field Form Name

10.2.1.1 Field Form File Already Exists

If the format of a field form has already been specified and the specifications saved in a field form template file, the user may enter the filename containing the desired specifications in response to the prompt:

Select Field Form Template Name (A):

The user can proceed to section 10.2.2

10.2.1.2 Field Form File Does Not Exist

If the format of a field form has not been specified and the user wishes to capture specifications for a field form format, enter a file name at the prompt:

Select Field Form Template Name (A):

The program will respond with:

Do You Want to Try Another One? N
******* File Does Not Exist *******

By accepting the default (N), the program will prompt:

Do You Want to Create a New Template? Y

By accepting the default (Y), the program will prompt for the components that are to be included on the form. Valid responses for the prompts include:

- **Y** – accept this selection (default)
- **N** – decline this selection
- **Q** – quit specifying component selection and start over

Record types (Sitefile, CONS, MISC, etc.) are displayed beginning with Sitefile and progressing through the ground-water record types; if the user types **Y** for the displayed record type, individual components within the record type will be prompted for inclusion on the form. The user will be given the opportunity to specify the number of blank lines for components where multiple entries are possible.

Continue this process until all desired components are specified. The program then asks if the user wants to Output a Field Form; this is discussed in section 10.2.2.

Typing **N** to the prompt, “**Do You Want to Create a New Form?**” will start the process over at the prompt for creating field forms.

10.2.2 Output a Field Form

Once the component specifications have been entered either from an existing specification file, or by the creation of a new one, the program prompts:

Do You Want to Output a Field Form? Y

If the user types **N**, the program is terminated. If the user types **Y** or <Enter>, processing continues by prompting for the output filename of the generated field form:

Select Form Output File Name (A): f.llenfest.004_____

The default is in the format f.username.xxx, where user name is the user’s ID and xxx is a sequence number that forms a unique output file name. The user may override the default and type in a different filename.

10.2.2.1 Specifying File Containing Site IDs

The program prompts for site IDs. It first asks if a list of sites is to be used:

Do You Want to Use a Site List? N

If the user has a file containing a list of sites, answer **Y** (the default is **N**). This will cause the program to prompt for the filename:

Select Site List File Name (A): gw.sites_____

Once the file name is entered and <Enter> is pressed, the program will generate the file containing the specified field form. The program will indicate completion of the task by displaying the following on the top of the screen:

******* FLDFORM Terminated *******

10.2.2.2 Specifying Site IDs Without a File

The program prompts for site IDs. It first asks if a list of sites is to be used:

Do You Want to Use a Site List? N

If the user does not have a file containing a list of sites and wishes to enter the site IDs individually, answer **N** or accept the default. This will cause the program to prompt for site IDs:

Select A Site (Blank = New Site): _____

The user may either hit the carriage return to generate a blank form, illustrated above, or enter an individual site ID to generate a field form for the entered site which will be populated with sitefile information for the specified components as illustrated below:

Select A Site (Blank = New Site): USGS 474251114385201

The program will indicate completion of the task by displaying the following on the top of the screen:

***** FLDFORM Terminated *****

10.3 Examples of Field Forms

10.3.1 Example One - Single Existing Site

The following example is for a single site that exists in the database. Selected Sitefile components are displayed. Blank entries for five LSD (land surface datum) Water Levels with Status, Method of Measurement, and Party ID were specified.

```

                                GWSI FIELD ENTRY FORM

Site: USGS 474251114385201
                                GENERAL SITE DATA
                                Project No.: 4630-02000

Station Name: 23N24W34ADAA01
District: 30
State: 30 County: 089
Latitude: 474251 Longitude: 1143852
Altitude: 2878.57
Hydrologic Unit Code: 17010212
Standard Time Zone Code: MST Daylight Savings Time Flag: Y
Remarks:
Primary Aquifer: 110ALVM
Well Depth: 377
-----
                                WATER-LEVEL DATA

Water Level from LSD:
Status: Method of Measurement: Party ID:
-----

Water Level from LSD:
Status: Method of Measurement: Party ID:
-----

Water Level from LSD:
Status: Method of Measurement: Party ID:
-----

Water Level from LSD:
Status: Method of Measurement: Party ID:
-----

Water Level from LSD:
Status: Method of Measurement: Party ID:
-----
    
```

10.3.2 Example Two - Single Blank Form

The following example uses the same specifications as Example 1, but blank form was requested. Selected Sitefile components are displayed. Blank entries for five LSD Water Levels with Status, Method of Measurement, and Party ID were specified.

```

GWSI FIELD ENTRY FORM

Site:

                                GENERAL SITE DATA

                                Project No.:

Station Name:
District:
State:      County:
Latitude:      Longitude:
Altitude:
Hydrologic Unit Code:
Standard Time Zone Code:      Daylight Savings Time Flag:
Remarks:
Primary Aquifer:
Well Depth:

-----

                                WATER-LEVEL DATA

Water Level from LSD:
Status:      Method of Measurement:      Party ID:

-----

Water Level from LSD:
Status:      Method of Measurement:      Party ID:

-----

Water Level from LSD:
Status:      Method of Measurement:      Party ID:

-----

Water Level from LSD:
Status:      Method of Measurement:      Party ID:

-----

Water Level from LSD:
Status:      Method of Measurement:      Party ID:

-----
    
```

11 GROUND-WATER LOCAL TRANSLATION PROGRAM

by George W. Hawkins

The Ground-Water Local Translation (ltrans) program is an interactive program to translate a local number into agency code and site identification (Site ID) number.

11.1 Introduction

In many instances, personnel at a site are more familiar with their station name or local identifier (C12 or SNAME) for a site than the station identification number. The translation process uses the NWIS Sitefile to either look for a certain local number, or match a standard UNIX wildcard template. In both cases, when there is more than one site that matches, all of the duplicates are translated. Input and output files are user-specified for maximum flexibility. There is an option to temporarily disable translated output so that translations (particularly when using wildcards) can be tested without generating a lot of undesired output. There is also an option to enter an agency code and station identification number, or just a station identification number using the current default agency code (initially "USGS").

11.2 Program Operation

Execute the ltrans program by selecting the Utilities Menu (Option 91) from the GWSI Main Menu, which takes you to the Utilities Menu. Select Option 1.

```

*****
*  Utilities Menu for WRD GWSI Database # 01 -- NWIS-4_4_0-20040329
*****
Code  Program Description
----  -
  1 : Translate Station Name Into Agency and Site ID
  2 : Inventory Station in Site, GW and QW Files
  3 : Query Support Files
  4 : Data Dictionary List
  5 : List Site Records

 10 : Change GW/QW Database #

 92 : Database Checking Menu          93 : GW Check List Menu

 98 : Exit to Previous Menu          99 : Exit to UNIX

Enter UNIX Command or Select Program Code:

```

After selecting Option 1, the program identifies itself and begins prompting for input and output files and configuration options. Then each local number entered is translated (if possible) to the equivalent agency code and station identification number. This is best explained by an example run of the program as shown below.

EXAMPLE RUN

Program ltrans revision NWIS_[vers.no.+yyyymmdd] .
 This program translates local ID into agency and station ID using the Sitefile. Local ID input is upper and lowercase sensitive.

For local ID's to translate,
enter input file (terminal=*)? *
 Unless otherwise stated, default end-of-file from keyboard is "control-c".
 For agency and station id's,
enter output file (terminal=*)? *
Include local ID in output file (y;n) [?]? ?

If **no**, each line in the output file will contain the agency code and station ID. Some application programs accept this format for input. If **yes**, each output line will contain the agency code, station ID, and local ID. This may not be compatible for input to application programs, but allows the creation of cross reference lists.

Include local id in output file (y;n) [?]? Y
Enable wildcards (y;n) [?]? ?

If **no**, the standard UNIX wildcard characters have no special meaning. If **yes**, when at least one wildcard character is encountered in a local ID, a full sitefile retrieval pass may be made(very slow), and all sites whose local ID/station name match the wildcard are output. Embedded blanks are significant, but trailing blanks are not. Avoid using a wildcard character in column 1 (except ^ that must be in column 1). This produces the most time-consuming retrieval.

Enable wildcards (y;n) [?]? yY

Writing to the disk output file can be toggled on and off by entering a ~ in column 1 for the local ID/station name. Output is initially enabled. This allows you to practice a retrieval without generating undesired output.

You can retrieve by agency code ("USGS" is the initial default) and station name by entering the desired information preceded by a ~. Order and spacing are important if an agency code is entered.

Enter local ID: k 30
 (k 30) translates to
 (Kk 30)Is the Kk correct?
 USGS 404149073571201 K 30
 Enter local ID: ~
 Output to disk file is disabled.
 Enter local ID: k 30@.@

(K 30@.@) has selected
 (K 30 . 2)
 USGS 404147073571408 K 30 . 2

(k 30@.@) has selected
 (k 30 . 2)
 USGS 404147073571401 k 30 . 2
 2 sites matched.
 Output to disk file is disabled.

```
Enter local ID: ~
Output to disk file is enabled.
enter local ID: ~404147073571401

(USGS 404147073571401) translates to
(K 30 . 2 )
USGS 404147073571401 K 30 . 2
ENTER LOCAL ID: ~USGS 404147073571408

(USGS 404147073571408) translates to
(K 30 . 2 )
USGS 404147073571408 K 30 . 2
Enter local ID: (Control-C was pressed here)
Total elapsed wall time is: 0 HR 1 MI 50.31515 SEC
Total elapsed cpu time is: 0 HR 0 MI 1.87494 SEC
**** Stop
```

12 STATION CHANGE: INVENTORY, CHANGE, OR DELETE

The Station Change program provides the ability to inventory, change a station identifier, or delete a site and all of the site's related data. This program provides information for a site from the Site, Ground-Water, Water-Quality, SWUDS, and ADAPS data tables. Because station change affects multi-discipline data, exercise **extreme caution** during its use. Only individuals with DBA access can use the change and delete functions. Users with write access can only run the inventory part of this program.

12.1 Program Operation

Execute the program by selecting Option 91 from the GWSI Main Menu, which takes you to the Utilities Menu. Select Option 2: Station inventory, change, or delete. The same program is also available in [QWDATA – Utilities menu: option 3](#) and [GWSI system menu: option 3](#).

The program will expect the user to enter the database number to be searched. The database number entered and any other databases that share the same sitefile (e.g. QA database) will be included when the program is run. **Note: This means that a change or delete of a station in one database will be applied to all databases that share the same sitefile.**

To determine what databases share a sitefile on your system ask your NWIS database administrator (DBA) to run the following command as user *nwis*:

```
nwdb -q
```

The databases followed with '->' indicate that a shared sitefile is used for that database (e.g., database 02 shares a sitefile with database 01). Output from the command should look similar to:

```
--01 Oklahoma District environmental database.  
+-AD  
+-GW  
+-QW  
  
--02 Oklahoma District quality-control database.  
+-GW -> 01  
+-QW  
  
--33 NAWQA aggregated environmental data from 1994 study units.  
+-AD  
+-GW  
+-QW  
  
--34 NAWQA aggregated quality-control data from 1994 study  
units.  
+-GW -> 33  
+-QW
```

Once the database number has been entered, the program allows the user to choose to inventory, change, or delete a station:

```
Your current GW database is number 01

Database number: 01

Site Inventory, Change, or Delete
-----
This program inventories, changes, or
deletes *all* database records for a
single agency code and site number.

[I]nventory, [C]hange, [D]elete, or [Q]uit? icdQ):
```

Station Inventory

If inventory (I) is selected, the user has an option to enter a single station or file of agency codes and site numbers. This file can be created manually using an editor or it can be a file created by any of the NWIS retrieval programs, from any subsystem, as long as the format is correct. The format of this file must be agency code in columns 1-5 and station ID in columns 6-20. Any information after column 20 is ignored. If an invalid agency code or site number is entered, the program will stop and display the following error message:

```
Enter agency code: USXXX
Enter site number: 25252525

Site USXXX 25252525 does not exist in database 01

[I]nventory, [C]hange, [D]elete, or [Q]uit? [icdQ]: i

Enter agency code: USGS
Enter site number: 22222222

Site 'USGS 22222222' does not exist in database 01

[I]nventory, [C]hange, [D]elete, or [Q]uit? [icdQ]:
```

When a valid agency code and site are entered, the program will search the site, ground-water, water-quality, ADAPS, and water-use tables to determine what is stored in the database for the site entered. Output can be sent to the screen or to a file. Output to the screen and to a file will be similar to:

Enter agency code: USGS
 Enter site number: 06130000

Site: 'USGS 06130000', Flatwillow Creek near Mosby MT

Database: 01

Common Tables	Rows
=====	=====
SITE	1
SITEFILE	1

ADAPS Tables	Rows
=====	=====
AD_SITE	1
AD_INDEX	1
LOC	1
DD	5
DV	9
DV_DATA	2716

QW Tables	Rows
=====	=====
QW_SAMPLE	97
QW_RESULT	2023
QW_RESULT_CM	127
QW_VAL_QUAL	10

Database: 02

Common Tables	Rows
=====	=====
SITE	1
SITEFILE	1

QW Tables	Rows
=====	=====
QW_SAMPLE	11
QW_RESULT	54
QW_RESULT_CM	54
QW_VAL_QUAL	1

Enter agency code: usgs
 Enter site number: 463722111590201

Site: 'USGS 463722111590201', 10N03W16DBAD01 Database: 01

Common Tables	Rows
=====	=====
SITE	1
SITEFILE	1
SITE_OWNER	1

```

GWSI
  Tables                                     Rows
  =====
  GW_CONS                                   1
  GW_CSNG                                   1
  GW_GEOH                                   1
  GW_HOLE                                   1
  GW_LEV                                    59
  GW_LOGS                                   1
  GW_MPNT                                   1
  GW_NETW                                   2
  GW_OPEN                                   1
  GW_OTID                                   4
  GW_VIST                                   3

  QW
  Tables                                     Rows
  =====
  QW_SAMPLE                                 5
  QW_RESULT                                 78
  QW_VAL_QUAL                               4

Database: 02
Common
  Tables                                     Rows
  =====
  SITE                                       1
  SITEFILE                                  1
  SITE_OWNER                                1

GWSI
  Tables                                     Rows
  =====
  GW_CONS                                   1
  GW_CSNG                                   1
  GW_GEOH                                   1
  GW_HOLE                                   1
  GW_LEV                                    59
  GW_LOGS                                   1
  GW_MPNT                                   1
  GW_NETW                                   2
  GW_OPEN                                   1
  GW_OTID                                   4
  GW_VIST                                   3

  QW
  Tables                                     Rows
  =====
  QW_SAMPLE                                 7
  QW_RESULT                                 13
  QW_RESULT_CM                              13
  QW_VAL_QUAL                               8
Do you want to save the inventory report to a file? [yN]:

```

The output can be saved to a file by entering a 'y' at the last query. The file will be named stnchange.datetime.txt where 'datetime' is the date and time the program was run. For example, stnchange-6-18-2007-9:34:48.txt.

Station Change

Only a user with DBA access can use this function of this program. If change ('C') is selected, the program will ask for a valid agency code and site number to be entered of the station to be changed. A file of stations cannot be run for the change option. The next query will ask for the agency code and site number for the new station:

```
Database number: 01

Site Inventory, Change, or Delete
-----
This program inventories, changes, or
deletes *all* database records for a
single agency code and site number.

[I]nventory, [C]hange, [D]elete, or [Q]uit? [icdQ]: c

Enter agency code: USGS
Enter site number: 22222222
Enter new agency code and site number for
'USGS 22222222', :
Enter agency code: USXXX
Enter site number: 22222228

invalid agency code
agency codes are listed in the agency table.

[I]nventory, [C]hange, [D]elete, or [Q]uit? [icdQ]: c

Enter agency code: USGS
Enter site number: 22222222
Enter new agency code and site number for
'USGS 22222222', :
Enter agency code: USGS
Enter site number: 22222228
```

After a new agency code and site number have been entered, the program will print to the screen all files affected by the change.

A warning message will be printed indicating that if the site is changed, the site's data will be removed from the web and that the data will have to be uploaded again. The user will then be asked for confirmation of the change:

```

Site: 'USGS 22222222', Test site 01/16/03

Database: 01
Common
Tables                               Rows
=====
SITE                                  1
SITEFILE                              1

Database: 02

Common
Tables                               Rows
=====
SITE                                  1
SITEFILE                              1
**** Warning ****
When you change a site in Station Change, the program
will remove that site's data from the web.
After changing a site you will have to upload your
data to the web again to restore that site's web-related
information.

Are you sure you want to change site 'USGS 22222222' to
'USGS 22222228'? ("YES" or "N") You must answer "YES"
    
```

The word 'YES' (capital letters) must be entered for the change to take effect. Queries for the name of the person making the change and to enter a reason for the change appear on the screen:

```

Are you sure you want to change site 'USGS 22222222' to
'USGS 22222228'? ("YES" or "N") You must answer "YES"
for changes to take effect: YES

Name of person requesting site change: Mickey Mouse
    
```

It is important for future reviews of this site that the reason for the change is entered accurately. Output similar to the following should appear on the screen:


```
'USGS 22222222' was successfully changed to
'USGS 22222228' in database 01. You can review the changes to
database 01 with the stnhistory program.

Site: 'USGS 22222228', Dorrie's test site 01/16/03
Database: 01
Common
Tables                                Rows
=====
SITE                                  1
SITEFILE                              1

Database: 02
Common
Tables                                Rows
=====
SITE                                  1
SITEFILE                              1

[I]nventory, [C]hange, [D]elete, or [Q]uit? [icdQ]:
```

Station Delete

Only a user with DBA access can use this function of this program. If delete (D) is selected, the program will ask for a valid agency code and site number to be entered. A file of sites cannot be used for input for the delete option. Output will appear on the screen that includes all files affected by deleting the site followed by a query asking for confirmation of the station delete:

```
[I]nventory, [C]hange, [D]elete, or [Q]uit? [icdQ]: d

Enter agency code: USGS
Enter site number: 22222228

Site: 'USGS 22222228', Test site 01/16/03

Database: 01

Common
Tables                                Rows
=====
SITE                                  1
SITEFILE                              1

Database: 02

Common
Tables                                Rows
=====
SITE                                  1
SITEFILE                              1

Are you sure you want to delete these rows? ("YES" or "N")
You must answer "YES" to delete this site:
```

The word 'YES' (capital letters) must be entered for the delete to take effect. Queries for the name of the person requesting the delete and a reason for the delete appear on the screen:

```
Are you sure you want to delete these rows? ("YES" or "N")
You must answer "YES" to delete this site: YES
```

```
Name of person requesting site delete: Donald Duck
Reason for site change: Testing
```

A confirmation of the delete should appear:

```
Station 'USGS 22222228' in database 01 has been deleted
You can review the changes to database 01 with the stnhistory program
[I]nventory, [C]hange, [D]elete, or [Q]uit? [icdQ]:
```

Note: *The station history program can be used to review changes to sites in the database. A description of the station history program is available in [Chapter 3 of the GWSI DBA Manual](#).*

13 QUERY SUPPORT FILES

by Leslie W. Lenfest, Jr.

```

*****
* Check GW/QW Support Files -- NWIS-4_4_0-20040329
*   You are using Water-Quality Database Number 01
*****

Code  Program Description          Code  Program Description
----  -
 1 : List Site Records by Site ID
 2 : Scan For and Display Parameter Codes & Definitions
 3 : List Geologic Unit by Code or Name
 4 : List Hydrologic Unit by Code or Name
 5 : List Country/State/County (FIPS) Information by Code or Name
 6 : List Country/State/County with Geographical Information by Code
 7 : Write Parameter Report to a File

98 : Exit to Previous Menu          99 : Exit to UNIX

Enter UNIX Command or Select Program Code:

```

13.1 Option 1 – List Site Records (/usr/opt/nwis/bin/qwshowsite)

Option 1 produces a list of the contents of site information for selected sites from the Sitefile. Retrieval specifications are entered through a series of prompts.

Output may either be displayed on the user's terminal or written to a text file. If the user elects to send the output to a file, the program prompts the user to enter a filename; if no file name is entered at the prompt, output will be written to a file named SITE_FILE in the current user directory. The filename may include the pathname to the file (up to 128 characters) if the file is not to be located in the users current operating directory.

Station numbers may either be entered from the users terminal or from a file containing a list of sites for which site information is to be retrieved. A maximum of 400 station numbers may be retrieved. If more than 400 sites are submitted, only the first 400 are used. If the user elects to enter station numbers from the terminal, a blank line is displayed. Enter agency code in the first 5 columns, left justified, followed by the station number in columns 6 – 20, also left justified. If the agency code is only 4 characters (e.g. USGS), there will be a blank space in column 5 between the agency code and station number. Depending on the agency code and length of station number, the input would look like the following examples:

```
          1          2
12345678901234567890
USGS 01123456
USEPA01123457
USGS 474251114385201
```

If the user chooses to get a list of station numbers from a text file by responding N or NO at the prompt for source of entered station numbers, the user will be prompted to enter a file name, including a pathname (up to 128 characters) if not in the users current operating directory. The format for station number in the text file is the same as described above for interactive entry.

The output file contains carriage-control characters and should be printed with the “asa” UNIX command using the following syntax:

```
asa test_showsite | lp -dprintername
```

13.2 Option 2 – Scan For and Display Parameter Codes & Definitions

The details of this option are described in the QWDATA User Documentation -- [Chapter 3.6.2](#).

13.3 Option 3 – List Geologic Unit by Code or Name (/usr/opt/nwis/util/gwckaqr)

Option 3, the gwckaqr routine, retrieves geologic unit codes and names, and displays this information at the users terminal. The user may select geologic units by code or by name, and may further restrict retrieval by specifying Country and State in the selection criteria.

To retrieve Geologic Unit Code information, select Option 3 from the Query Support Files Menu; the following menu will appear:

```
Geologic Unit Name and Code Retrieval Routine

Options for Retrieving Geologic Unit Name or Code:

 1 -- Retrieve/Select a Geologic Unit by Code
 2 -- Retrieve/Select a Geologic Unit by Name
 3 -- Select a Country and State (no state will list all matches)
 0 -- Quit

What do you want to do (0-3)?
```

Geologic Unit Code information may be selected individually by **Unit Code** by selecting “1” from the menu. Enter the 8-character Geologic Unit Code at the prompt. This will

result in the display of the Geologic Unit Code and Name for any Country and State in the database. For example, if the Geologic Unit description for “231HLYK” is desired:

```

What do you want to do (0-3)? 1

Enter 8-character geologic unit code: 231HLYK

GEOLOGIC
UNIT CODE  NAME
231HLYK    HOLYOKE BASALT

```

NOTE: Currently, if the geologic unit code describes more than one geologic unit in different states, the program will only display the first unit found in the master aageol.all.states list of geologic unites associated with that code.

Geologic Unit Code information may be selected by **Geologic Unit Name** by selecting “2” from the menu. Enter either the specific Geologic Unit name or partial Geologic Unit name. Typing in the beginning string of characters for a Geologic Unit name will result in the display of all Geologic Units that begin with those characters. For example, typing in “alle” will result in the following list of Geologic Unit Codes and their description:

```

What do you want to do (0-3)? 2

Enter geologic unit name: alle

GEOLOGIC
UNIT CODE  NAME
211ALVL    ALLEN VALLEY SHALE OF INDIANOLA GROUP
211ARDG    ALLEN RIDGE FORMATION
324ALGN    ALLEGHENY FORMATION
324ALPV    ALLEGHENY AND POTTSVILLE GROUPS, INDIFF.
337ALMN    ALLEN MOUNTAIN LIMESTONE OF MADISON GROUP
341ALGP    ALLEGRIPPIS SANDSTONE MEMBER OF CHEMUNG FORMATION
371ALNN    ALLENTOWN DOLOMITE'

```

The user can restrict Geologic Unit selection by Country and State by selecting “3” from the menu. Enter the Country/State codes at the prompts. Once this has been entered all subsequent retrievals of geologic unit codes or names while still in the program will be restricted to geologic units within the entered state. If no codes or names are valid for the state, the program will display a warning to that effect. For example, 231HLYK is a Geologic Unit that resides in Massachusetts. If the state code for Montana is entered using option 3 on this menu, the following will occur if 231HLYK is entered:

```

What do you want to do (0-3)? 3

Enter 2-character country code (<CR> = none): US

Enter 2-character state code (<CR> = none): 30

Options for Retrieving Geologic Unit Name or Code (US State: 30):

  1 -- Retrieve/Select a Geologic Unit by Code
  2 -- Retrieve/Select a Geologic Unit by Name

  3 -- Select a Country and State (no state will list all
matches)

  0 -- Quit

What do you want to do (0-3)? 1

Enter 8-character geologic unit code: 231HLYK

No such Geologic Unit Code for this State.

```

To restore selection of all geologic unit codes or names, select “3” from the menu, and type in a carriage return (<CR> = none).

To exit the program, select “0” from the menu.

13.4 Option 4 – List Hydrologic Unit by Code or Name (/usr/opt/nwis/util/gwckhuc)

Option 4, the gwckhuc routine, retrieves Watershed Hydrologic Unit Boundary Codes and Names for all US states, and displays this information at the users terminal. The user may select hydrologic units by code or by name, and may further restrict retrieval by specifying Country and State in the selection criteria.

To retrieve Hydrologic Unit Code (HUC) information, select Option 4 from the Query Support Files Menu; the following menu will appear:

```

Hydrologic Unit Name and Code Retrieval Routine

Options for Retrieving Hydrologic Unit Name or Code:

  1 -- Retrieve/Select a Hydrologic Unit by Code
  2 -- Retrieve/Select a Hydrologic Unit by Name

  3 -- Select a Country and State (no state will list all matches)

  0 -- Quit

What do you want to do (0-3)?

```

Hydrologic Unit Code information may be selected by **Unit Code** by selecting “1” from the menu. Hydrologic Unit Codes are currently defined by 2-, 4-, 6-, or 8-numerical character codes. The 2-character codes define Region (most general description); 4-character code defines subregion; 6-character code defines accounting units, and the 8-character code defines cataloging unit (most specific description). The user may specify 1 to 8 characters; all codes beginning with the entered characters will be displayed to the users terminal screen. Entry of a 1-character code will result in the most general selection of Hydrologic Unit codes and the greatest number of codes displayed; entry of an 8-character code will result in the selection of a specific unit and display only 1 unit. For example, if “190604” is entered as the Unit Code, the following will be displayed:

```

What do you want to do (0-3)? 1

Enter hydrologic unit code: 190604

HYDROLOGIC
UNIT CODE      NAME

190604         Prudhoe Bay
19060401       Kuparuk River
19060402       Sagavanirktok River
19060403       Mikkelsen Bay

```

Hydrologic Unit Code information may be selected by Unit Name by selecting “2” from the menu. Enter either the specific Hydrologic Unit name or partial Hydrologic Unit name. Typing in the beginning string of characters for Hydrologic Unit name will result in the display of all Hydrologic Units that begin with those characters. For example, typing in “des” will result in the following list of Hydrologic Unit Codes and their description:

```

What do you want to do (0-3)? 2

Enter hydrologic unit name: des

HYDROLOGIC
UNIT CODE      NAME

071000         Des Moines
07100001       Des Moines Headwaters
07120004       Des Plaines
09010002       Des Lacs
17110016       Deschutes

```

The user can restrict Hydrologic Unit Code selection by Country and State by selecting “3” from the menu. Enter the Country/State codes at the prompts. Once this has been entered all subsequent retrievals of hydrologic unit codes or names while still in the program will be restricted to hydrologic units within the entered state. If no codes or names are valid for the state, the program will display a warning to that effect. For example, 17110016 is a HUC for Washington State. If the state code for Wyoming is

entered using option 3 on this menu, the following will occur if 17110016 is entered as a HUC:

```
What do you want to do (0-3)? 3

Enter 2-character country code (<CR> = none): us

Enter 2-character state code (<CR> = none): 56

Options for Retrieving Hydrologic Unit Name or Code (US State: 56:

    1 -- Retrieve/Select a Hydrologic Unit by Code
    2 -- Retrieve/Select a Hydrologic Unit by Name
    3 -- Select a Country and State (no state will list all matches)
    0 -- Quit

What do you want to do (0-3)? 1

Enter hydrologic unit code: 17110016

No such Hydrologic Unit Code for this State.
```

To restore selection of all hydrologic unit codes or names, select “#” from the menu, and type in a carriage return (<CR> = none).

To exit the program, select “0” from the menu.

13.5 Option 5 – List Country/State/County (FIPS) Information by Code or Name **(/usr/opt/nwis/util/gwckfips)**

Standardized codes for Countries, States, and Counties have been established by the Federal Information Processing Standards (FIPS). These codes are stored within the NWIS database, along with other descriptive information such as altitude, latitude, and longitude ranges. Since these codes are terse, by their nature, and do not always convey an intuitive meaning, this utility is provided to translate codes to their intended meaning.

Option 5, the gwckfips routine, is used to browse the FIPS Code File (FIPSFIL) and retrieve codes and names for Countries, States, and Counties.

To retrieve FIPS information, select Option 5 from the Query Support Files Menu; the following menu will appear:

Country/State/County Name and Code Retrieval Routine**Options for Retrieving Country, State, or County Name or Code:**

- 1 -- Retrieve/Select a Country by Code
- 2 -- Retrieve/Select a Country by Name
- 3 -- Retrieve/Select a US State by Code
- 4 -- Retrieve/Select a US State by Name
- 5 -- Retrieve/Select a US State by Abbreviation
- 6 -- Retrieve/Select a US County by Code
- 7 -- Retrieve/Select a US County by Name

- 0 - Quit

Country, State, and County names may be selected by their FIPS **Codes** by selecting option 1, 3, or 6, respectively, from the menu. Enter the 2 alpha character code for countries (US for United States is the assumed default for country code), 2-digit number for states, and 3-digit number for counties at the prompt.

- Country Code (1) – Country Code and Country Name will be displayed at the users terminal. If a country code other than the default (US) is selected, this country code will be displayed in the descriptions of Options 4 – 7 in the menu. To reset the selection, go back to option 1 or 2 to enter the desired default country code. For example, if Canada is selected:

```
What do you want to do (0-7)? 1
Enter 2-character country code (<CR> = US): cn
COUNTRY CODE:   CN      COUNTRY NAME:   CANADA
Options for Retrieving Country, State, or County Name or Code:
1 -- Retrieve/Select a Country by Code
2 -- Retrieve/Select a Country by Name
3 -- Retrieve/Select a CN State by Code
4 -- Retrieve/Select a CN State by Name
5 -- Retrieve/Select a CN State by Abbreviation
6 -- Retrieve/Select a CN County by Code
7 -- Retrieve/Select a CN County by Name
0 - Quit
```

- State Code (3) – Country Code, Country Name, State Code, State Name, and State Abbreviation will be displayed at the users terminal. If a state within a country other than US, which is the default country, is desired, the country will have to be selected before this option is selected. Once a state is selected it becomes the default state for counties and is displayed on the menu.

```

What do you want to do (0-7)? 3

Enter 2-character state code: 56

COUNTRY CODE:   US           COUNTRY NAME:   UNITED STATES OF AMERICA
STATE CODE:     56           STATE NAME:     WYOMING        STATE ABBREV: WY

```

- County Code (6) – Country Code, Country Name, State Code, State Name, State Abbreviation, County Code, and County Name will be displayed at the users terminal. If Country and State have not been selected yet, the country is defaulted to US, and the user will be prompted to enter the state name and then the county code.

```

What do you want to do (0-7)? 6

Enter 2-character state code: 56

Enter 3-character county code: 001

COUNTRY CODE:   US           COUNTRY NAME:   UNITED STATES OF AMERICA
STATE CODE:     56           STATE NAME:     WYOMING        STATE ABBREV: WY
COUNTY CODE:   001         COUNTY NAME:     ALBANY

```

Country, State, and County FIPS codes may be selected by their **Name** by selecting option 2, 4, or 7, respectively, from the menu. Enter the entire name for the Country, State, and/or County at the prompt. Partial names may be entered, and all Countries, States, or Counties that begin with that string will be displayed, but further processing may not work correctly because a single country is required to get the state information and a single state is required to get the county information. These options work just as options 1, 3, and 6, except the user needs to type in the Country, State, or County Name.

State information may be selected by their FIPS abbreviation by selecting option 5 from the menu. Enter the FIPS State Abbreviation. Country Code, Country Name, State Code, State Name, and State Abbreviation will be displayed.

```
What do you want to do (0-7)? 5

Enter 2-character state abbreviation: ma

COUNTRY CODE:  US      COUNTRY NAME:  UNITED STATES OF AMERICA
STATE CODE:    25      STATE NAME:    MASSACHUSETTS      STATE
ABBREV: MA
```

Type in a “0” to exit this utility.

13.6 Option 6 – List Country/State/County with Geographical Information by Code **(/usr/opt/nwis/util/gwstcty)**

Option 6, the gwckstcty routine, interacts with the FIPSFIL, and is used to retrieve a tabular list of state names, state abbreviations, state codes, minimum and maximum latitudes and longitudes, and minimum and maximum altitudes (if available) in various formats and configurations.

Retrieval and output specifications for all of the utilities are entered at prompts for each of the utilities before the utility is run:

- Output may be run in the background or interactively at the users terminal
- Output may be directed either to the users terminal (default) or to a user specified file. A carriage return without entering a file name will result in the information being displayed at the screen. If the list of information is displayed at the users terminal

To retrieve Geographical information, select Option 6 from the Query Support Files menu; the following menu will appear:

```
Country/State/County Info Retrieval Routine

Options for Checking Country, State, and County Data:

1 -- Retrieve Information for One State, By Country and State Codes
2 -- Retrieve All States for One Country, By Country Code
3 -- Retrieve All States for All Countries
4 -- Retrieve One County, By Country, State, and County Codes
5 -- Retrieve All Counties for One State, By Country and State Code
6 -- Retrieve All Counties for All States, By Country Code
7 -- Retrieve All Counties for All Countries and All States

0 -- Quit

What do you want to do (0-7)?
```

To retrieve **state** information, select Option 1, 2, or 3 from the menu. These result in the retrieval of Country Name, Country Code, State Name, Abbreviation, and Code, Latitude and Longitude ranges and the date these data were last updated for one state, all states in one country, and all states in all countries, respectively. States, Counties, or Latitude/Longitude ranges may not be available for countries or outside of the US. An example of a retrieval of state information for one state is shown below:

```

What do you want to do (0-7)? 1

Enter name for output file (<CR> = Output to Screen):

Enter 2-character country code (<CR> = US):

Enter 2-digit state code: 56

COUNTRY NAME: UNITED STATES OF AMERICA          CODE: US
STATE NAME: WYOMING                               MIN LAT: 405927
STATE ABBR: WY                                     MAX LAT: 450029
STATE CODE: 56                                    MIN LONG: 1040257
LAST UPDATE: 19860915                             MAX LONG: 1110341

```

To retrieve **county** level information, select Options 4 – 7 from the menu. These result in the retrieval of Country Name, Country Code, State Name, Abbreviation, and Code, County Name and Code, Latitude and Longitude ranges and the date these data were last updated for one or all counties by state and/or country. States, Counties, or Latitude/Longitude ranges may not be available for countries, states or counties outside of the US. An example of a retrieval of county information for one county is shown below:

```

What do you want to do (0-7)? 4

Enter name for output file (<CR> = Output to Screen):

Enter 2-character country code (<CR> = US):

Enter 2-digit state code: 56

Enter 3-digit county code: 017

COUNTRY NAME: UNITED STATES OF AMERICA          CODE: US
STATE NAME: WYOMING                               CODE: 56
STATE ABBR: WY                                     MIN LAT: 432713
COUNTY NAME: HOT SPRINGS                         MAX LAT: 440454
COUNTY CODE: 017                                MIN LONG: 1073504
LAST UPDATE: 19831108                             MAX LONG: 1091822

```

Type "0" to exit the utility.

13.7 Option 7 – Write Parameter Report to a File

The details of this option are described in the [QWDATA User Documentation -- Chapter 3.6.3](#).

14 CHANGE DEFAULT DATABASE NUMBER

by Leslie W. Lenfest, Jr.

The Change Default Database Number utility allows the user to change the default number for ground-water or water-quality databases. This utility is available from both the GWSI and the QWDATA programs and is fully described in [Chapter 11 of the GWSI DBA manual](#).

15 ERROR MESSAGES

By John W. Atwood and Leslie W. Lenfest, Jr.

Error messages may be displayed during any activity that may update the NWIS database. There are two sources of error messages:

- GWSI software may issue errors based on data validation using reference list checks and logical checks of entered data during Screen Entry, Query Entry, Edit, and Update.
- Status errors may be returned by the RETR routines that, in most cases, indicate database problems. These generally occur during the Update procedure.

The following is a list of the error messages that may occur during data entry using Screen Entry, Query Entry, Data Validation, and the Edit and Update procedures. Negative numbered error messages represent non-fatal warning messages.

Error messages are displayed in specific formats, depending on the activity being performed, and convey information about the error beyond the textual description:

- (1) Screen and Query Entry, and Sitefile/GWSI Data validation (gwcheck) programs display error message surrounded by either dashes or asterisks to indicate whether the reported error is a warning (dashes) or fatal (asterisks), for example:

Warning error message:

----- Latitude (C009) Latitude Out of Range for County -----

Fatal error message:

******* Station name (C900) Mandatory Field Missing *******

- (2) Error messages displayed during Edit and Update are in three fields across the line. Field one is in the first column of the line and is either blank (warning) or populated with an asterisk (error). Field two contains an error code which consists of the error number and component number; if the error is due to something other than a specific component, the error number contains '000' for the last three digits. Field three is a textual description of the error. Examples are shown below:

*** 17028 Well depth (C028) Depth Deeper than Hole Depth--ERROR---
VALUE REJECTED**

**-32709 Measurement time (C709) Water-Level Time Incompatible with
Reference**

*** 36003 Record classification (C003) Data Reliability Mandatory for GW
Site--ERROR---RECORD REJECTED**

*** 88000 Record already exists, cannot be added--ERROR---RECORD
REJECTED**

GWSI Data Validation Errors

Error #	Description
-35	No Altitude Reference Available
-34	No Measuring Point Reference Available
-33	Water Level Mandatory with Datum
-32	Water-Level Time Incompatible with Reference
-31	Altitude Out of Range for State
-29	Depth Deeper than Well Depth
-28	Longitude More than 10 Seconds Off Site ID
-27	Latitude More than 10 Seconds Off Site ID
-25	Station Name Not Unique
-24	Duplicate Use of Water
-23	Duplicate Use of Site
-22	Site Exists
-20	Longitude Out of Range for County
-19	Latitude Out of Range for County
-18	Measuring Point Begin Date After End Date
-17	Mandatory for Current Water-Level Status
-16	Group Well Depth Shallowest Below Deepest
-15	Logged Interval Top Below Bottom
-14	Network Begin Year After End Year
-13	Test Interval Top Below Bottom
-12	Geohydrologic Log Interval Top Below Bottom
-11	Opening Interval Top Below Bottom
-10	Casing Interval Top Below Bottom
-9	Construction Interval Top Below Bottom
-8	Web Flag of "N" Changed to "C"
-7	Measuring Point Altitude Mismatch
-6	Date Proceeds Date Constructed
-5	Water Level May Not Be Compatible With Status
-4	Hole Dept Shallower than Existing Depths
-3	Date Constructed Preceded by Existing Dates
-2	Possible Error in Site ID
-1	Code Obsolete or Not Valid for Use
0	No Error
1	Mandatory Field Missing
2	Wrong Data Type
3	Invalid Date
4	Invalid Character Code
5	Value Out of Range
6	Value Does Not Fit Template
7	Invalid Site ID
8	Invalid District Code

Error #	Description
9	Invalid State Code
10	Invalid County Code
11	Invalid Degree/Minute/Second Value
12	Latitude Out of Range for State
13	Longitude Out of Range for State
14	Cannot Change Web-Ready Flag to "Y"
15	Date Precedes Date Constructed
16	Site Use Mandatory for Well
17	Depth Deeper than Hole Depth
18	Water-Level Date Mandatory
19	Status Not Compatible With Water Level
20	No Status or Water Level, But Water-Level Date
21	Construction Interval Bottom Above Top
22	Casing Interval Bottom Above Top
23	Opening Interval Bottom Above Top
24	Geohydrologic Log Interval Bottom Above Top
25	Invalid Aquifer Code
26	Lithologic Modifier With No Lithology
27	Test Interval Bottom Above Top
28	Network End Year Before Begin Year
29	Logged Interval Bottom Above Top
30	Group Well Depth Deepest Above Shallowest
31	Water Level or Status Required
32	Measuring Point End Date Before Begin Date
33	Invalid Site Type Change
34	Not Valid for this Site Type
35	Status Requires Missing Water Level
36	Data Reliability Mandatory for GW Site
37	National Water Use Code Not Valid for Site Type
38	Invalid Time
39	Record type for GW.MISC in error
41	Duplicate Use of Site
42	Duplicate Use of Water
43	Primary Aquifer Already Exists, set to (U)nknown
44	Measuring Point Below Bottom of Well
45	Water-Level Type Required
46	Selected State Code Not in HUC File
47	Cannot Change Web-Ready Flag from "N"
48	Required with Altitude
49	Greater than Drainage Area
51	No Measuring Point Reference Available
52	No Altitude Reference Available
53	Station Name Not Unique

Error #	Description
54	Required with Lat/Lon
55	No Such Measuring Point
56	WL Date Does Not Match MP Date Range
57	Coordinate Must Include Both Lat and Lon
58	NAWQA Aquifer Already Exists, set to (U)known
59	Parent record does not exist
60	Spring data not allowed for other site types
61	Error during calculation
62	Record type for GW.GEOH in error
63	Record type for GW.HYDR in error
64	Invalid
65	Too long, first name and/or middle initial ignored
66	Site has been deleted, no other processing allowed
67	No R value found
68	R value pair invalid, no = sign
69	No ending delimiter to "R" value pair
70	R value nonnumeric
71	R value invalid
72	T value missing
73	T value pair invalid, no = sign
74	Transaction code invalid
75	No ending delimiter to T value pair
76	Site is a mandatory item, invalid using this program
77	No = or # sign in component value pair
78	Component number invalid
79	Value too long-missing delimiter
80	Maximum field length exceeded
81	Site already exists, cannot be added
82	Site does not exist, cannot be modified
83	Database problem, contact database administrator
84	Unsuccessful add
85	Unsuccessful modify
86	Record sequence number for invalid or missing
87	Record does not exist, cannot be deleted ***
88	Record already exists, cannot be added
89	Record does not exist, cannot be modified
90	Unique discharge record not found
92	Site delete is not allowed using this program
93	Unsuccessful delete
94	Record failed Edit must be corrected before update
95	Record type in error
96	Site does not exist, no other transactions allowed
97	Invalid, value set to (U)known

Error #	Description
98	Missing, value set to (U)nknown
99	Cannot change water-level entry type code
100	R number is not defined
101	Water-level reference incompatible with time
102	Invalid record type
103	Used by SWUDS and cannot be deleted
104	Null Address No Longer Valid
105	Ingres Error while checking component compatibility
106	Construction data not allowed for this site type
107	Hole data not allowed for this site type
108	Casing data not allowed for this site type
109	Openings data not allowed for this site type
110	Lift data not allowed for this site type
111	Repairs data not allowed for this site type
112	Spring data not allowed for this site type
113	MP data not allowed for this site type
114	Discharge data not allowed for this site type
115	Owner data not allowed for this site type
116	Contact data not allowed for this site type
117	Other ID data not allowed for this site type
118	Other Data not allowed for this site type
119	Visit data not allowed for this site type
120	Logs data not allowed for this site type
121	Network data not allowed for this site type
122	Special data not allowed for this site type
123	Miscellaneous data not allowed for this site type
124	Cooperator data not allowed for this site type
125	Remarks data not allowed for this site type
126	Water Level data not allowed for this site type
127	Geohydrologic data not allowed for this site type
128	Aquifer data not allowed for this site type
129	Hydraulics data not allowed for this site type
130	Coefficient data not allowed for this site type
131	Observation data not allowed for this site type
132	Agency Required for Source A or S
998	Component not allowed for this site type
999	Invalid component number

GWSI Status Errors

Error #	Description
1	Successful retrieval, but duplicates exist for the current key.
2	File open failed or file not open as needed.
4	End of file. (No more records matching the query)
6	Requested record not found, next record returned.
7	Requested record not found, no new record returned.
8	Invalid program function requested.
9	QW result record full.
10	On a call to lock a record, the requested record is already locked, possible by another user. (Concurrency error. Someone changed the record since it was retrieved.
11	On a call to update a record, the record to be updated was not locked – record cannot be updated. (Primary key does not match the one previously retrieved.
12	Attempt to add a duplicate key when duplicates are not allowed (primary key or secondary key) OR on update or delete, more than one record of primary key found.
13	Ingres error encountered.

16.1 Tip Sheet: How do I establish a new site?

- ❖ The Office of Ground Water (OGW) also provides guidance on establishing a site. This Tip Sheet assumes that the site has been established according to the OGW guidance provided in OGW Memo [98.02](#) and (or) [Ground Water Procedures Document 2](#) and that you are ready to enter the data into GWSI, the Ground-Water Site-Inventory.
- ❖ Start GWSI at your UNIX system prompt. Choose option 2 from the main GWSI menu – **Screen Entry**.
- ❖ Enter N at the prompt-list query. If you want more information about the prompt list, refer to [Section 4.3.1](#) and [Tip Sheet 16.13](#).
- ❖ Enter the name for the output file that will be used for batch entry later.
- ❖ The next screen will look similar to:

******* Make Site Selection *******

Agency Code USGS_	Site ID
Station Name	

- ❖ Enter the agency code of the site being established.
 - ❖ Enter the Site ID. Sites other than ground-water sites may have IDs of various formats. Ask your district's discipline specialist to help you determine an appropriate ID for your site. For most ground-water sites, the site ID is a 15-digit number of the format *llaattnnnggooqq*, where:
 - *ll* is the degrees of latitude of the site,
 - *aa* is the minutes of latitude,
 - *tt* is the seconds of latitude to the nearest whole second,
 - *nnn* is the degrees of longitude (don't use the negative sign),
 - *gg* is the minutes of longitude,
 - *oo* is the seconds of longitude to the nearest whole second, and
 - *qq* is a two-digit sequence number.
- The first site at this latitude and longitude should have a sequence number of 01, and additional sites at this latitude and longitude have incremented sequence numbers.
- ❖ If this 15-digit ID is not in the database, GWSI will identify it as a new site. Check to make sure the items you entered are correct, then enter **Y**. If the site ID exists in the database, GWSI will identify the site by name. Because you are trying to establish a new site, you will need to reply **N** to the question of whether the items you entered are correct. Check your

spatial coordinates carefully. If they are correct, you will probably have to increment the two-digit sequence number of the site in order to have GWSI regard the site as being new.

- ❖ When you have entered a site ID that GWSI regards as new, you will be taken to the Sitefile entry screen, which contains many fields on two separate pages. Some fields are mandatory during establishment of a site; some are conditionally mandatory, depending on the type of site and on other fields that you enter. To see which fields are mandatory and conditionally mandatory, see http://www.nwis.er.usgs.gov/currentdocs/gw/gwintrocoding_Sect2-0.pdf.
- ❖ Enter data into appropriate fields. For ground-water sites, you *must* enter:

Field Name	Field #	Note
Station name	Field 2	
Site type	Field 3	Primary site type is GW. Secondary types are available and optional. Type “?” to see the site types.
District code	Field 4	Enter “?” for a list of valid codes.
Country code	Field 5	Enter “US” for the United States.
State code	Field 6	Enter “?” for a list of valid codes.
County code	Field 7	Enter “?” for a list of valid codes for your state.
Latitude	Field 8	GWSI will enter a number based on the site ID, but you may edit this number.
Longitude	Field 9	GWSI will enter a number based on the site ID, but you may edit this number.
Latitude/longitude accuracy	Field 10	Enter “?” for a list of valid codes.
Latitude/longitude method	Field 11	Enter “?” for a list of valid codes.
Latitude/longitude datum	Field 12	Enter “?” for a list of valid codes.
Time-zone code	Field 21	Enter “?” for a list of valid codes.
Daylight savings time flag	Field 22	Enter “Y” if this site is in a zone that uses daylight savings time, “N” otherwise.

On the second page, the following fields are mandatory:

Field Name	Field #	Note
Data reliability	Field 35	Enter “?” for a list of valid codes.
Use of site	Field 37	Enter “?” for a list of valid codes.

- ❖ If you choose to enter altitude data (field 13 on the first page), you must also enter:

Field Name	Field #	Note
Altitude accuracy	Field 14	Enter accuracy, in feet or fraction of a foot.
Altitude method	Field 15	Enter “?” for a list of valid codes.
Altitude datum	Field 16	Enter “?” for a list of valid codes.

Note: You should try to enter as much information as you can through field 47. Retrievals can be constructed to select sites on the basis of the content of nearly any field; therefore the more information entered for a site, the more specific retrievals can be.

- ❖ When you finish with field 47, you will be asked whether you want to edit any of the 47 fields on the Sitefile entry screens. You can enter the number of the field to edit that field.
- ❖ If you are finished with edits, enter “0” to store the sitefile information in the output file. The next screen introduces seven additional tables into which you can enter data (none of which are mandatory for site establishment), allows you the option of changing to another site (option 2) or exiting the input program (option 1). Some of the data recommended for site establishment in [Ground Water Procedures Document 2](#) are housed in tables other than the Sitefile. If you choose to enter data in other tables, you will always return to this screen when you are finished with data entry. When you are finished entering all data for your site, select option 1 (exit HDRINP program).
- ❖ At the main GWSI menu, select option 3 (Edit GW data). You will be prompted for the name of your data file, which you identified at the beginning of your data entry, and a one-digit “batch” character of your choice. GWSI will run your data file through a series of error-checking routines and will list them in an error file. You should review the error file to determine whether all the data pass the error checks. Some of the data may generate warnings; these data will still go into the database. Data that generate errors, will not go into the database.
- ❖ When your data file passes the edit checks, its contents are ready to be added to the database. Most users do not have permissions to do this. At the main GWSI menu, select option 7 (copy file to WATIN). This will make a copy of your data file in a directory maintained by your district’s GWSI database administrator. Send the database administrator an email stating the name of the file that you copied to the WATIN directory, and he or she will update the database.
- ❖ It is good practice to examine the data once they are in the database. Follow instructions in [Tip Sheet 16.8](#) to retrieve the data from the database. If you need to edit any of the data, follow the instructions in [Tip Sheets 16.2](#) or [16.3](#).

16.2 Tip Sheet: Editing Options

- ❖ This Tip Sheet briefly describes the on-screen controls you can use to edit fields and move between fields.
- ❖ You may use the following control codes to move about the screen or perform other functions while you are editing your data. These codes are functional in Query and Screen Entry. The codes appear in two lines at the bottom of the screen:

Optns S.Fld N.Fld L.Fld Repnt In:Ed Abort End Blank Ins.C Del.C No.Ctrl Ys.Ctrl
? \$ > < % & ! * # _ \ " ^

- ❖ These control characters are used to display error messages, warnings, and special prompts. If a detectable error is made, an error message is displayed on the bottom line and a continuation prompt is displayed on the line above the error message. Special messages and prompts are displayed in the same manner. When the special message or prompt is no longer needed, the control code list is restored.

- ❖ Here are the meanings of these codes:

<u>Code</u>	<u>Abbreviation</u>	<u>Meaning</u>
?	Optns	Display valid values or options for that field.
\$	S.Fld	Reset the current field. (Can also use the "Delete" key.)
>	N.Fld	Advance control to the next field.
<	L.Fld	Go back to the previous field.
%	Repnt	Repaint the screen. You may also use ctrl-L.
&	In:Ed	Toggle between input and edit modes.
!	Abort	Abort the current screen or program. If ! does not abort the session, use ctrl-P to interrupt.

- ❖ The following codes have special meanings when used anywhere in an input field:

<u>Code</u>	<u>Abbreviation</u>	<u>Meaning</u>
Space	Spacebar	Advance one character.
<BS>	Backspace	Go back one character.
*	End	Leave blanks to the end of the field and continue.
#	Blank	Put a blank in the current character space.
_	Ins.C	Insert a character. (This is an underscore mark.)
\	Del.C	Delete a character.
"	No.Ctrl	Enter the next typed character.
^	Ys.Ctrl	Execute the next typed character.

- ❖ Many of the original EMACS commands also are accepted as screen control, but they may not function the same as commands in more current versions of EMACS. See the Users Guide, section 5 (Screen Entry Program).

- ❖ Following is an example of using the control character “?” to obtain a list of options for a field. The screen is GWSI’s screen edit. At the field that is highlighted on the screen, type “?” and <ENTER>:

```

Terminal
Window Edit Options Help
***** General Site Data *****
Agency Code USGS      Site ID 01010000      Project No. 1=442300100
Station Name 2=St. John River at Ninemile Bridge, Maine
Site Type 3=ST        District 4=23      Country 5=US      State 6=23      County 7=003
                        Latitude 8= 464200      Longitude 9= 0694259
Latitude/Longitude:    Accuracy 10=S      Method 11=M      Datum 12=NAD27
Altitude 13= 931.26    Accuracy 14=.01    Method 15=L      Datum 16=NGVD29
Land Net 17=          Topographic Setting 18=
Hydrologic Unit Code 19=01010001      Drainage Basin Code 20=
Standard Time Zone Code 21=AKST      (-09:00)      Daylight Savings Time Flag 22=Y
Map Name 23=Ninemile Bridge      Map Scale 24= 24000      Agency Use 25=A
National Water Use Code 26=          Data Type 27=A
Instruments 28=Y Y Y Y          1234567890ABCDEF
                        1234567890ABCDEF      Date Inventoried 29= - -
Remarks 30=          Web Flag 31=Y

Optns S.Fld N.Fld L.Fld Repnt In:Ed Abort End Blank Ins.C Del.C No.Ctrl Ys.Ctrl
? $ > < % & ! * # _ \ " ^
    
```

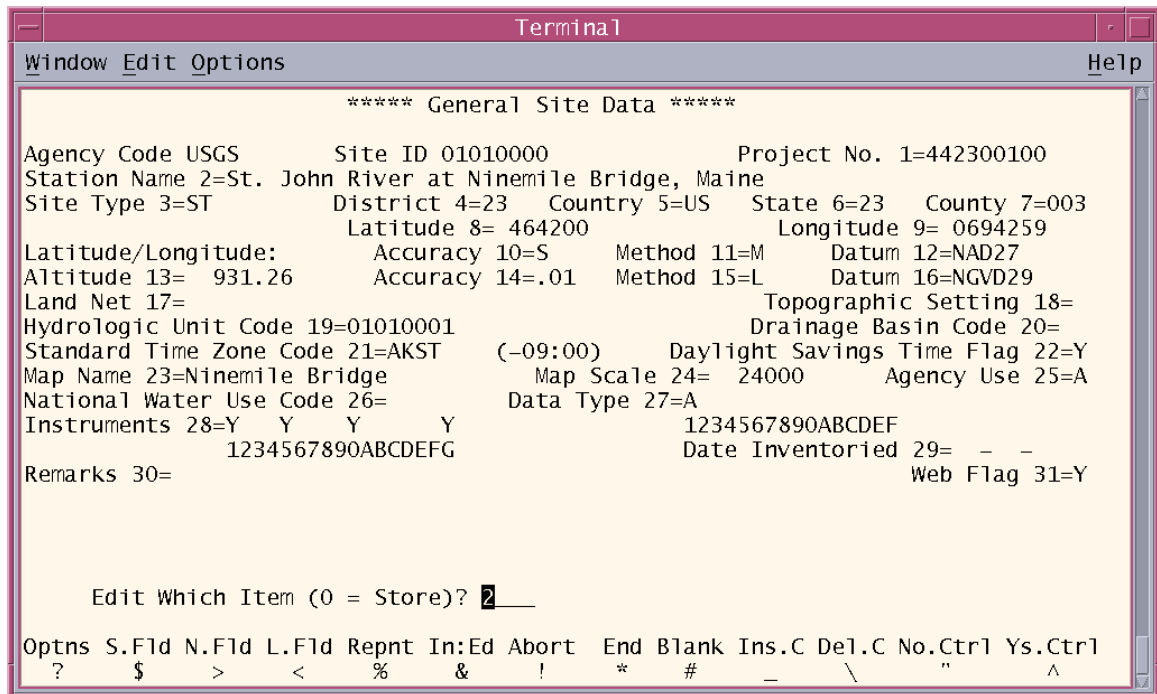
- ❖ Note that a list of valid codes is printed at the bottom of the screen, and instructions for finding more codes as well:

```

Terminal
Window Edit Options Help
***** General Site Data *****
Agency Code USGS      Site ID 01010000      Project No. 1=442300100
Station Name 2=St. John River at Ninemile Bridge, Maine
Site Type 3=ST        District 4=23      Country 5=US      State 6=23      County 7=003
                        Latitude 8= 464200      Longitude 9= 0694259
Latitude/Longitude:    Accuracy 10=S      Method 11=M      Datum 12=NAD27
Altitude 13= 931.26    Accuracy 14=.01    Method 15=L      Datum 16=NGVD29
Land Net 17=          Topographic Setting 18=
Hydrologic Unit Code 19=01010001      Drainage Basin Code 20=
Standard Time Zone Code 21=AKST      (-09:00)      Daylight Savings Time Flag 22=Y
Map Name 23=Ninemile Bridge      Map Scale 24= 24000      Agency Use 25=A
National Water Use Code 26=          Data Type 27=A
Instruments 28=Y Y Y Y          1234567890ABCDEF
                        1234567890ABCDEF      Date Inventoried 29= - -
Remarks 30=          Web Flag 31=Y

A = Alluvial fan      F = Flat surface      M = Mangrove swamp
B = Playa              G = Flood plain      O = Offshore
C = Stream channel    H = Hilltop          P = Pediment
D = Local depression  K = Sinkhole         S = Hillside
E = Dunes              L = Lake or Swamp    for more, enter a "?"
Optns S.Fld N.Fld L.Fld Repnt In:Ed Abort End Blank Ins.C Del.C No.Ctrl Ys.Ctrl
? $ > < % & ! * # _ \ " ^
    
```

- ❖ The user may respond with an <ENTER> to return to the field being edited, a “?” to see more options in the list, or a valid code selected from the list.
- ❖ A second example illustrates the use of the “&” character, which toggles on or off the prompt for the number of a field to be edited. Use of the “&” character can save the user many keystrokes by moving the cursor to the correct field immediately rather than by moving it one field at a time through the entire screen.
- ❖ In Screen Edit, enter a “&” at the beginning of the first field, which is *Project Number*. (Note that the “&” will not appear when you type, but the field prompt will appear, placing the user in *Edit* mode.)



- ❖ The system will query the user for successive fields, one at a time, until the “&” character is entered again (placing the user back in *Insert* mode).
- ❖ When the user is finished editing or entering the data, only data in those fields that have been changed will be saved to the system edit file.

16.3 Tip Sheet: How do I edit site information?

- ❖ This Tip Sheet assumes that a site was established according to the OGW guidance provided in OGW Memo [98.02](#) and (or) [Ground Water Procedures Document 2](#), the data were entered into GWSI (Ground-Water Site-Inventory System), and you are ready to modify existing data in GWSI. [Tip Sheet 16.1](#) provides help on establishing a site in GWSI.
- ❖ Start GWSI at your UNIX system prompt. Choose option 5 from the main GWSI menu – **Update Sitefile Only**. Edits can also be done through **Query Entry** (option 1) or **Screen Entry** (option 2), but option 5 is best for editing Sitefile information only. Note that option 5 can work only if you have write-access to the GWSI database. If you do not have write-access, you will have to choose options 1 or 2, save your edits to a file, and ask your Database Administrator to process the edits for you.
- ❖ The next screen will look similar to:

```
***** Make Site Selection *****
Agency Code USGS_                Site ID
Station Name
```

- ❖ Enter the agency code of the site being edited. Enter the Site ID of the site being edited. For most ground-water sites, the site ID is a 15-digit number that is based on the latitude and longitude of the site, plus a sequence number. If the site ID exists in the database, GWSI will identify the site by name. If the agency code and site ID are correct, reply <Y> to the question of whether the items you entered are correct; if not, reply <N> and correct the information.
- ❖ All existing data in the Sitefile for your site will appear on the General Site Data screen. You can move around in the screen using special characters that are listed at the bottom of the screen. Generally, a stroke of the <Enter> key will move you to the next field and the <Backspace> key will blank out the data in a field. For a complete list of screen control characters, see [section 5](#) of the GWSI documentation.
- ❖ As you edit your site data, be aware that some fields *must* be populated before you can move past them. To see which fields are mandatory and conditionally mandatory, see http://www.nwis.er.usgs.gov/currentdocs/gw/gwintrocoding_Sect2-0.pdf.
- ❖ Edit the desired fields. You may choose to <Enter> through fields to which you do not make changes; in this case, GWSI will retain the existing data. When you <Enter> through field 47 (on the second page), you will be asked “**Edit which item?**” which will allow you to edit any of the 47 fields on the Sitefile entry screens. You can enter the number of the field to return to that field for additional edits.

- ❖ When you are finished with edits, enter “0” at the “**Edit which item?**” prompt to store the Sitefile information in the output file. You will be prompted for whether you want to edit another site. If so, enter <Y>; otherwise, enter <N>.
- ❖ If you entered <N>, GWSI will begin the error-checking and updating functions on your data file automatically. Errors will be listed in an error file. You should review the error file to determine whether all the data pass the error checks. Some of the data may generate warnings; these data will still go into the database. Data that generate errors, however, will not go into the database.
- ❖ GWSI will update the database with your edits.
- ❖ It is good practice to examine the data once they are in the database. Follow instructions in [Tip Sheet 16.8](#) to retrieve the data from the database.

16.4 Tip Sheet: How do I enter new water levels using query entry?

Note : The sampling site must exist in the NWIS Sitefile before new water levels can be entered. The program for adding a new site to the NWIS database is described in [Chapter 2 of the GW User's Manual](#). Access to this program may be restricted to more experienced database users.

- ❖ Choose option 1 from the main GWSI menu – **Query Entry**.
- ❖ If you want to use a prompt list, enter a **Y** at the next prompt, otherwise enter **N**. If you want more information about the prompt list, refer to [Section 4.3.1](#).
- ❖ Enter the name for the output file that will be used for batch entry later.
- ❖ The next prompt will be for the agency code. Enter the agency code of the site for the water levels being entered.
- ❖ The next prompt will be for Site ID. You can enter the Site ID or enter a <CR> which will allow for entry of the Site Name.
- ❖ Check to make sure the items you entered are correct, then enter **Y**.
- ❖ The following instructions are all based on the assumption that a prompt list was *not* used. If you are using a prompt list, the queries that appear will be different.
- ❖ If you have any changes to General Site Data, you can make them during the next 32 prompts. If you have no changes, simply return through these prompts.
- ❖ If you have any changes to Ground-water Site Data, you can make them in the next 12 prompts. If you have no changes, simply return through these prompts.
- ❖ Enter **NEXT** for the prompt about editing Construction Records.
- ❖ Enter **NEXT** for the prompt about editing Miscellaneous Records.
- ❖ Enter 000 for the prompt about editing Discharge Records.
- ❖ Enter **NEXT** for the prompt about editing Geohydrologic Records.
- ❖ Enter **NEXT** for the prompt about editing Hydraulic Records.
- ❖ When the following prompt appears, enter the date of the water-level measurement you wish to enter:

******* Water Level Record Selection *******

>>>>>"00-00-0000"=No More Water Levels
Measurement Date MM-DD-YYYY

- ❖ Next, enter the time of the water-level measurement. This is not currently a required field.
- ❖ If the items look correct, enter a **Y** for the next prompt.
- ❖ Enter the water-level entry code. To get a list of the options, enter a **?** and a list of valid entries will appear on the screen. The choices for this option are:

Water Level Entry Code=?

Water Level Entered From:

L = Land Surface, M = Measuring Point, S = Vertical Datum

- ❖ Depending on the water-level entry code entered, a prompt will appear asking for the water level based on the entry type entered. Enter the water level from the entry type you entered.
- ❖ Enter the status code that applies or leave this entry blank for static measurement. You can show all the choices on the screen by entering a **?**. The choices for this option are:

A = Atmospheric Prs	I = Injector site	S = Nearby pumping
B = Tide stage	J = Injector monitor	T = Nrby rent pumped
D = Dry	M = Plugged	V = Foreign subst.
E = Recent flowing	N = Discontinued	W = Destroyed
F = Flowing	O = Obstruction	X = SW effects
G = Nearby flowing	P = Pumping	Z = Other

- ❖ Enter the method of measurement code that applies. You can show all the choices on the screen by entering a **?**. The choices for this option are:

A = Airline	H = Calib.Pres.Gage	T = Electric tape
B = Recorder	L = Geophysical log	U = Unknown
C = Calib. airline	M = Manometer	V = Calib.Elec.Tape
E = Estimated	N = Nonrec. gage	Z = Other
F = Transducer	R = Reported	
G = Pressure-gage	S = Steel tape	

- ❖ If the water level was from a continuous recorder, enter the reference code that indicates how the water level was chosen from the readings for that day. The choices can be shown on the screen by entering a ?. The choices for this option are:

M = Daily Maximum	X = Daily Mean	P = 12:00 Midnight
N = Daily Minumum	A = 12:00 Noon	

- ❖ Enter an accuracy for the water-level measurement entered. The choices can be shown on the screen by entering a ?. The choices for this option are:

0 = Nearest Foot	2 = Nearest 1/100 Ft
1 = Nearest 1/10 Ft	9 = Not nearest Ft

- ❖ Enter the source for the water-level measurement entered. **This is a mandatory entry.** The choices can be shown on the screen by entering a ?. The choices for this option are:

A = Other Gov't	L = Logs	R = Other Reported
D = Driller	M = Memory	S = Reporting Agency
G = Geologist	O = Owner	Z = Other

- ❖ At the next prompt you can enter the initials or names of the party that made the water-level measurement.
- ❖ At the next prompt you can enter the agency of the person(s) who made the water-level measurement.
- ❖ At the next prompt, enter a **Y** or a **N** which will determine whether the water level you entered is displayed on NWISWeb.
- ❖ Finally, enter an item number to change if you made an error in the steps above, or enter **0** to save your entries.
- ❖ If you have more water levels to enter for the same site, enter a **Y** at the next prompt; otherwise enter **N**.
- ❖ Enter 000 for the prompt about editing Observation Records.
- ❖ Enter a **Y** if you have completed entering data for the site.

- ❖ If you have water levels for another site you would like to enter, at the following prompt enter a **Y** and repeat the instructions from above, otherwise enter **N**:

Another Site? (Y or N): Y

- ❖ After you have entered all water levels for all sites, you will have created an input file that can be processed into the database. For instructions about how to complete this step refer to [Chapter 6](#) and [Chapter 7](#) of the GWSI User's Manual or consult with your local GWSI DBA.

16.5 Tip Sheet: How do I enter new water levels using screen entry?

Note : The sampling site must exist in the NWIS Sitefile before new water levels can be entered. The program for adding a new site to the NWIS database is described in [Chapter 2 of the GW User's Manual](#). Access to this program may be restricted to more experienced database users.

- ❖ Choose option 2 from the main GWSI menu – **Screen Entry**.
- ❖ If you want to use a prompt list, enter a **Y** at the next prompt, otherwise enter **N**. If you want more information about the prompt list, refer to [Section 4.3.1](#).
- ❖ Enter the name for the output file that will be used for batch entry later.
- ❖ The next screen that appears will look similar to:

```
***** Make Site Selection *****  
Agency Code USGS_           Site ID  
Station Name
```

- ❖ Enter the agency code of the site for the water levels being entered.
- ❖ Enter the Site ID or enter a <CR> which will allow for entry of the Station Name.
- ❖ Enter **9 – Water-Level Data Record**.
- ❖ Check to make sure the items you entered are correct, then enter **Y**.
- ❖ The following instructions are all based on the assumption that a prompt list was *not* used. If you are using a prompt list, the queries that appear will be different.
- ❖ When the following screen appears, enter the date and time of the water-level measurement you wish to enter (time is not a required field):

```
***** Water-Level Record Selection *****  
Agency Code USGS           Site ID 463722111590201  
Measurement Date MM-DD-YYYY   Time Water Level Measured  
>>>>>"00-00-0000"=No More Water Levels
```

- ❖ If the items are correct enter a **Y** for the next prompt.
- ❖ A prompt for water-level entry code will appear on the screen above. Enter the water-level entry code. To get a list of the options, enter a **?** and a list of valid entries will appear on the screen. The choices for this option are listed on the following page:

Water Level Entered From:

L = Land Surface, M = Measuring Point, S = Vertical Datum

- ❖ Depending on the water-level entry code entered, a screen similar to the following will appear:

```
***** Water Level Data *****

Agency Code USGS      Site ID 463722111590201
Measurement Date 05-04-2003      Time Water Level Measured
Water Level from LSD 1=____.____      Status 2=
Method of Measurement 3=      Reference 4=      Accuracy 5=
Source 6=      Party ID 7=      Source Agency 8=USGS
Web-ready Flag 9=Y
```

- ❖ Enter the status code that applies or leave this entry blank for static measurement. You can show all the choices on the screen by entering a ?. The choices for this option are:

```
A = Atmospheric Prs      I = Injector site      S = Nearby pumping
B = Tide stage           J = Injector monitor   T = Nrby rcnt pumped
D = Dry                  M = Plugged           V = Foreign subst.
E = Recent flowing      N = Discontinued      W = Destroyed
F = Flowing              O = Obstruction       X = SW effects
G = Nearby flowing      P = Pumping           Z = Other
H = Nrby recent flow    R = Recently pumped
```

- ❖ Enter the method of measurement code that applies. You can show all the choices on the screen by entering a ?. The choices for this option are listed on the following page:

```
A = Airline      H = Calib.Pres.Gage      T = Electric tape
B = Recorder     L = Geophysical log      U = Unknown
C = Calib. airline M = Manometer           V = Calib.Elec.Tape
E = Estimated    N = Nonrec. gage       Z = Other
F = Transducer   R = Reported
G = Pressure-gage S = Steel tape
```

- ❖ If the water level was from a continuous recorder, enter the reference code that indicates how the water level was chosen from the readings for that day. The choices are shown on the screen by entering a ?. The choices for this option are:

M = Daily Maximum	X = Daily Mean	P = 12:00 Midnight
N = Daily Minimum	A = 12:00 Noon	

- ❖ Accuracy of the water-level measurement is automatically populated based on the value entered for the water level. If you wish to change it, you can do it here. The choices are shown on the screen by entering a ?. The choices for this option are:

0 = Nearest Foot	2 = Nearest 1/100 Ft
1 = Nearest 1/10 Ft	9 = Not nearest Ft

- ❖ Enter the source for the water-level measurement entered. **This is a mandatory entry.** The choices are shown on the screen by entering a ?. The choices for this option are:

A = Other Gov't	L = Logs	R = Other Reported
D = Driller	M = Memory	S = Reporting Agency
G = Geologist	O = Owner	Z = Other

- ❖ At the next prompt you can enter the initials or names of the party that made the water-level measurement.
- ❖ At the next prompt you can select the agency of the person(s) who made the water-level measurement from a pick list.
- ❖ At the next prompt a default of Y appears. Entering a Y or a N will determine whether the water level you entered is displayed on NWISWeb.
- ❖ Finally, enter either an item number to change if you made an error in the steps above, or enter 0 to save your entries.
- ❖ If you have more water levels to enter for the same site, enter a new date or a new time at the following screen (the default date will be the last entered):

```
***** Water Level Record Selection *****  
  
Agency Code USGS           Site ID 463722111590201  
Measurement Date MM-DD-YYYY   Time Water Level Measured  
>>>>>"00-00-0000"=No More Water Levels
```

- ❖ Follow the steps as outlined above to enter another water level.
- ❖ When you are finished entering water levels for a site, enter **00-00-0000** in the measurement date field.
- ❖ If you want to enter water levels for another site, hit the “Delete” key to clear the field; then enter **2 – Select New Site**.
- ❖ Follow the steps above beginning with entering the agency code and site information.
- ❖ When all data entry is completed for all sites, exit the screen entry program by selecting option **1 – Exit HDRINP** from the following menu:

```
1  Exit HDRINP Program
2  Select New Site
3  General Site Data Record
   (SITE)
4  Construction Data Records
   (CONS,HOLE,CSNG,OPEN,LIFT,REPR,MPNT)
5  Miscellaneous Data Records
   (OWNR,OCNT,OTID,OTDT,VIST,LOGS,NETW,SPEC,MSVL,COOP,RMKS)
6  Discharge Data Record
   (DISC)
7  Geohydrologic Data Records
   (GEOH,AQFR)
8  Hydraulic Data Records
   (HYDR,COEF)
9  Water Level Data Record
   (LEV)
```

- ❖ After you have entered all water levels for all sites, you will have created an input file that can be processed into the database. For instructions about how to complete this step refer to [Chapter 6](#) and [Chapter 7](#) of the GWSI User’s Manual or consult with your local GWSI DBA.

16.6 Tip Sheet: Retrieving Water Levels

This Tip Sheet describes how to retrieve water levels for one or more sites using option 6 of the GWSI Main Menu. The GWSI retrieval program provides the greatest flexibility for user- specified options. This How-to will cover just a basic retrieval with default options.

- ❖ Choose option 6 from the GWSI Main Menu – Retrieval/Tables.
- ❖ Enter “?” at any prompt if you need help to respond for specific queries.
- ❖ Enter set-up parameters (T/V,I/C/R, <CR>TI): <CR>
- ❖ Enter root path name (<CR>gw): <CR>
- ❖ Which field do you wish to use for gross selection of sites (1-11 <CR>1)? <CR>
- ❖ Do you wish to load gross select keys from a file (Y/N, <CR>=N)? <CR>
- ❖ Enter agency code <CR>USGS,"A"=Select all agencies/all sites): <CR>
- ❖ Which method of site selection do you wish to use (S/G/R/A, <CR>S)?<CR>
Specify sites, one-by-one
- ❖ Enter 1-15 character site ID (Enter <CR> to end): 344003118074801
- ❖ Enter 1-15 character site ID (Enter <CR> to end): 344003118074802
- ❖ Enter 1-15 character site ID (Enter <CR> to end): <CR>
- ❖ Any more agencies to select (Y/N<CR>=N)? <CR>

QUALIFY SITE SELECTION

The section of prompts allows the user to limit site selection based on site types, detail tests, and other criteria. Accepting the defaults will return only sites that have the Web-Ready flag set to ‘Y’. For internal retrievals, the user will need to select all sites. To do this change item #7 as follows:

- ❖ Enter item number to change, R to re-list items or <CR> to continue: 7
- ❖ Enter restriction options (<CR>=All Restrictions): - (enter a hyphen)
- ❖ Enter item number to change, R to re-list items or <CR> to continue: <CR>

FORMAT OF OUTPUT

- ❖ Specify format (1=Std, 2=Dump 3=Subfile, 4=Special (<CR>=1): 4
- ❖ Enter file name for output table (<CR>=gw.table): mygw.table (enter filename of choice)
- ❖ Enter the title you wish to appear at the top of each page (upper/lower case) – <CR>
The next section of prompts allows the user to define the water level output.
- ❖ Specify type water level table desired (1-4): 4

- ❖ Enter start year (<CR>=first available): <CR>
- ❖ Enter end year (<CR>=last available): <CR>
- ❖ Do you wish to output a period of record summary (Y/N, <CR>=N)? <CR>
- ❖ Enter alternate headings type (N/R/A,<CR> no change): <CR>
- ❖ Suppress status/method (Y/N, <CR>=N)? <CR>
- ❖ Enter number of water level groups/line (1-07, <CR>=4): <CR>
- ❖ Do you wish to restrict output of related files (Y/N, <CR>=N)? <CR>

REVIEW FORMAT OF OUTPUT

A summary of options (1-15) selected for your output will be displayed. This gives the user a chance to modify any item.

- ❖ Enter item number to change, R to re-list items or <CR> to continue: <CR>
An additional summary (options 16-18) for display is shown.
- ❖ Enter item number to change, R to re-list items or <CR> to continue: <CR>
- ❖ Enter review/modify parameters (C/R/M,GPDFLSTA, <CR>=C): <CR> C=Continue
- ❖ Enter name of program control file (<CR>=gw.ctrl): myfile.ctrl
- ❖ Enter processing parameters (I/P/B/R/Q,S,@,..,<<CR>=I): <CR> I=Interactive
A progress report is shown with the actual counts of sites and records retrieved.
- ❖ Enter file disposition parameters (C/R/S/X,D/E,<CR>=C): <CR> C=Continue
- ❖ Enter <CR> to exit, "A" to run another retrieval: <CR>
- ❖ Press <Enter> for Menu or Enter UNIX Command: 99

The user is returned to the system prompt and can view the output file using the following command:

```
hostname% more mygw.table
```

For printed output you can use the "asa" command:

```
asa mygw.table |lp -ylandscape
```

16.7 Retrieving Data Using a Control File

Making repeated retrievals of the same data, or of similar data sets, can be speeded up by the use of control files. At the end of the setup section of a retrieval, the setup specifications may be saved in a control file. This file can then be used in another run of the retrieval program to either repeat the first retrieval, or as a starting place for another retrieval where only one or two of the specifications are changed. A series of control files can be generated for a user's typical retrievals and then modified as needed. For example, a typical information request in a Water Science Center might be a radius search around a given latitude and longitude, with a set list of components in the output. A control file can be saved with the site selection method, output format, and component list, and then the latitude and longitude for the polygon retrieval can be modified when the control file is used for later retrievals.

- ❖ Use the GWSI retrieval program, main menu option 6, to make the retrieval.

```
GWSI RETRIEVAL/TABLING - NWIS-4_5_1-5 SPECIFICATIONS
COMPLETE.
```

```
Enter name of program control file (<CR>=gw.ctrl):
```

- ❖ Enter the name for your control file. Warning: if you routinely accept the default root path name of gw and do not change the control file name at this prompt, your control file will be overwritten on the next retrieval.
- ❖ To use the saved control file, enter TC (Terse, use control file) to the query asking you to identify your set-up parameters option after choosing Retrieval/Tables:

```
Enter set-up parameters (T/V,I/C/R,<CR>=TI): TC
```

- ❖ Enter the root path name for this retrieval and the name of the saved control file at the next 2 prompts:

```
Enter root path name (<CR>=gw):
```

```
Enter name of control file (<CR>=gw.ctrl):
```

- ❖ Next you have the option to Continue (run the retrieval as saved in the control file), Review (show the settings saved in the control file and modify them if desired), or Modify (jump immediately to the choices for that setting in Retrieval/Tabling without showing the saved setting stored in the control file).

❖ If you choose R or M, you must also specify one or more of the following topics:

- G Gross site selection
- P Polygon site selection
- D Detail site selection
- L Limit retrieval by site type, number sites/records
- F Format of output
- S Sorting specifications
- T Temporary fields (review only)
- A All topics

❖ For example, if it's been a while since you last used the control file, you might use **RA** to **R**eview **A**ll the saved settings. If you know you just need to change the polygon settings for a retrieval, you can use **MP** to **M**odify the **P**olygon site selection.

If you want to run the control file exactly as it was saved, hit Enter to continue with the retrieval.

```
GWSI RETRIEVAL/TABLING - NWIS-4_5_1-5 REVIEW/MODIFY
SPECIFICATIONS --
```

```
Enter review/modify parameters (C/R/M,GPDFLSTA,<CR>=C):
```


Tip Sheet: How do I enter reports into the problem-reporting system?

If you run across a problem while using NWIS or have questions about NWIS user documentation, reference lists or have ideas about enhancements, the problem-reporting system – GNATS – can be used to notify NWIS personnel. To access the GNATS system, use the URL: http://wwwnwis.er.usgs.gov/cgi-bin/gnats_home.pl.

The next screen should allow you to login using your Unix ID.

The main menu for GNATS will include options to create, edit, view, query, log out, and get help:

FOR NWIS USE ONLY

default	User: yourID Access: edit	NWIS Gnatsweb
MAIN PAGE	CREATE	QUERY
ADV. QUERY	LOG OUT	HELP

Main Page

Create Problem Report:	create	
Edit Problem Report:	edit	# <input type="text"/>
View Problem Report:	view	# <input type="text"/>
Query Problem Reports:	query	advanced query
Log Out / Change Database:	logout	
Get Help:	help	

Create a New Problem Report

- ❖ Before you enter a new problem report for the problem you have identified, please do the following:
 - Attempt to recreate the problem two more times. By producing the behavior three times, you insure it is a 'bug' that can be recreated by following specific steps.

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- Check the NWIS [Known Problems](#) page to see if a workaround to your problem is available.

- ❖ To create a new problem report, click the button from the main page.
- ❖ The Create Problem Report Screen contains several mandatory fields which contain an asterisk and are marked in red:

Create Problem Report

or

<p>(Mandatory fields marked (*))</p>	
<p>PR Creator's email ID:</p>	<input type="text" value="djgell"/>
<p>Notify-List Addresses to notify of significant PR changes</p>	<input type="text"/>
<p>*Category What area does this PR fall into?</p>	<p>Category Type: <input type="checkbox"/> General <input type="checkbox"/> ADAPS <input type="checkbox"/> QW <input type="checkbox"/> GW <input type="checkbox"/> WU <input type="checkbox"/> NWISWeb <input type="checkbox"/> NWIS-RT <input type="checkbox"/> LRGS <input type="checkbox"/> DAR <input type="checkbox"/> NWISView <input type="checkbox"/> NFM <input type="checkbox"/> PCFF <input type="checkbox"/> HANDHELDS</p> <input type="text" value="pending"/> <ul style="list-style-type: none"> Gen-dbChange - GW-Change GW/QW DB #, QW-Change DB Number Gen-db_admin - Data-Base Administration Problem Report Gen-ddl - Andy's DDL Gen-discur - DISCUR Problem Report Gen-gnats - Gnats Problem Report Gen-installation - NWIS Installation PR Gen-library - NWIS library PR Gen-nw db - NWDB Problem Report Gen-nw is - NWIS Default Problem Report Gen-nw is_coo - NWIS COO Issues Gen-reference_list - General Reference list issues <li style="background-color: #4a86e8; color: white;">Gen-security - NWIS Security Issues Gen-similar - Similar Code for Possible Consolidation Gen-stn_change - Station Change-Inventory, Change, or Delete Gen-test - Unit & Other Testing Gen-tkg2 - TkG2 GRAPHICS Gen-transfer - NWIS Transfer Problem Gen-upt_sitefile - GW-Update Sitefile Only, QW-Add new site or modify site info Gen-w at_move - WAT_MOVE
<p>*Synopsis One-line summary of the PR</p>	<input type="text"/>

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Severity How severe is the PR?	non-critical
Class The type of bug	sw -bug
*Release Release number or tag	NWIS 4.4
*Environment Copy the result of 'uname -a' or for NWIS 'nwisenv' command here	
*Description Precise description of the problem	
File Attachments:	Add a file attachment:
How-To-Repeat Code/input/activities to reproduce the problem	
Fix How to correct or work around the problem, if known	Unknown

- ❖ Notice that the “PR Creator’s email ID” field will be automatically populated with your user ID.
- ❖ If there are others that might want to know about the progress of a solution to your problem, put their email IDs in the “Notify-List” box, separated by spaces. When information is added to the problem report, the PR Creator and those on the Notify-List, will receive an email containing that information so that you know work is being completed on your problem.
- ❖ Choose the radio button for the “Category Type” that best represents where your problem occurred. The radio button chosen will limit the list of options in the category window. Click on the specific category from the window. If you know the name of the category, type it in the box, prefix first.
- ❖ The “Synopsis” should include enough of a description that someone would be able to determine the situation that caused the problem or created the question or enhancement. Consider using 10 words or less.

- ❖ Indicate the “Severity” by selecting from the drop-down list. Consider the extent to which your problem is hampering your work. A critical problem is one in which the programs stop working completely or data is incorrectly stored or displayed. A serious problem is one in which your workflow is seriously hampered. A non-critical problem is a question, an enhancement, or a problem that is annoying, but doesn’t significantly affect your workflow.
- ❖ Indicate the “Class” of the problem by selecting from the drop-down list:
 - Software-bug – Problem requiring a correction to software
 - Software-enhancement – Suggested change in functionality
 - Support – Support problem or question
 - Documentation – Correction or improvement in documentation
 - Reference-list – Request for a change to a reference list
 - Duplicate – Duplicate of another existing PR
 - Mistaken – Accidental PR submission

When you enter a new report you will likely use one of the first five choices.

- ❖ To determine the entries for release and environment, type `nwisenv` at your UNIX prompt. The release information is near the top of the resultant list in the form and will appear similar to: **nwis-4.4.1-4**. Choose the appropriate release from the “Release” pull down menu. Copy everything after **User Environment:** into the “Environment” text box.
- ❖ In the “Description” text box, enter a detailed description of your problem. This is your space to provide details to help NWIS personnel understand your problem. Please include results that illustrate the problem or how the problem is hampering your work. NWIS personnel will use this information to determine the severity of the problem as well as possible short-term and long-term solutions.
- ❖ If you have attachments that help illustrate the problem or provide information necessary to reproduce and troubleshoot the problem, provide the pathname in the “File Attachments” box. As an alternative, use the browse button to find the attachment on your machine, select it, and click open to place the pathname in the “File Attachments” box. **Note: The GNATS web interface will only allow the addition of one attachment at a time. If you have multiple attachments to associate with a particular problem report, you will have to edit the PR each time you want to add another attachment.**
- ❖ In the “How to Repeat” text box, enter a step-by-step description you used to cause the problem to occur. You should include a list of the menu options used and a description of the files you used, if applicable. This set of instructions is critical for NWIS personnel to duplicate the problem on a test system.

- ❖ The “Fix” box will be completed by NWIS personnel or others when a fix or workaround information is available to resolve the issue.
- ❖ As a last step, click on the Submit button at the top or bottom of the page. You should get a message back that you will receive an email containing the problem report number and some information that you entered. You should also be returned to your previous page quickly, but if needed, click on your web browser “Back” button.

Edit an Existing Problem Report

- ❖ To edit an existing problem report, enter the number of the PR you want to access and select the “edit” button from the main page.
- ❖ All of the same fields displayed in the “Create a new problem report” screen are displayed in the “Edit” screen as well as some additional fields:
 - **Priority:** This field will be used by NWIS personnel and User Group members to determine the importance of this PR relative to other PRs and tasks.
 - **Responsible:** This is the person responsible for completing work related to the initial problem.
 - **Reason Changed:** The responsible party or state of a PR will change as the problem is analyzed. There are two text boxes – one for why changes were made to the responsible party and one for why “changes to state” were made.
 - **Fix-Risk:** The choices in this field are available to NWIS personnel to identify the related risk to fix the initial problem.
 - **Fix-Difficulty:** The choices in this field are available to NWIS personnel to identify the difficulty of the fix for the initial problem.
 - **Release-Note:** The text in this box will be used to populate the NWIS release notes with information about this problem.
 - **Audit-Trail:** A list of the changes made to the report are found here.
 - **Unformatted:** This is an unformatted version of what appears in the Audit-Trail text box.
- ❖ When you receive notification that your PR has been changed, you might be asked to test the fix provided by NWIS personnel. The edit screen will allow you to make updates to the PR:
 - If the problem has been fixed, change the “State” from feedback to closed and enter information about how it was tested and/or why it was closed in the “Reason Changed” box.
 - If the problem has not been fixed, change the “State” to open and provide information about what is still wrong in the “Reason Changed” box.

- If the state does not need to be changed, but you have additional information to add to the report, append your information to the end of the text in the “Description” text box or attach a file using the “File Attachments” box.
- After you have made your edits, click on the submit button at the top or bottom of the page. If there were any errors on your edit page you will be notified. Click the “Back” button on your browser, fix the errors and submit again.
- When all the necessary information has been provided, you should get a message that your edit was successful and you will be returned to the previous page. You should be returned to your previous page quickly, but if needed, click the “Back” button on your web browser.

View an Existing Problem Report

- ❖ To view an existing problem report, enter the number for the PR you want to access and select the “view” button from the main page.
- ❖ All fields related to that PR will appear on the screen for you to view. If you decide to edit the same PR, click on the “edit” button at the top or bottom of the page.

Query Existing Problem Reports

- ❖ To query the existing problem reports, click on the “query” or “advanced query” buttons from the main page.
- ❖ The “query” button will take you to a page where you can build a query based on information stored in the GNATS database.
- ❖ The output from this query can be customized by selecting the columns of interest from the “Column Display” list and by sorting the PRs in the list on any field chosen from the “Sort by” list.
- ❖ The “advanced query” button will take you to a page where you can build a query based on text that occurs in the PR or by the date-of-arrival, modification or deletion of a PR.
- ❖ Common regular expressions for use with PR queries:
 - To limit the PRs to a particular category type (ADAPS, QW, GW, WU, NWIS-RT, NWISWeb, etc.), in query or advanced query, use the following in the category box and substitute the abbreviation for the category type you are interested in, for example:

ADAPS-.*

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- Category type abbreviations: ADAPS, QW, GW, WU, NWISWEB, Gen, RT, LRGS, DAR, NWISView, NFM, PCFF, HANDHELDS

Exiting the GNATS System

- ❖ When you are done using the GNATS system, select the “Log Out” button from any screen. This will return you to the login screen or close your browser.

16.11 Tip Sheet: How do I Generate Field Forms?

- ❖ Field forms allow you to customize a list of GWSI fields that can be used in the field to collect information for a new site or to add information for an existing site.
- ❖ The output from this program is a form that can be used by field personnel to collect information at a selected site.
- ❖ Forms for new sites contain blanks for all selected components and forms for existing sites will pre-populate selected Sitefile components where data exist.
- ❖ Start GWSI at your UNIX system prompt. Choose option 11 from the main GWSI menu—**Generate Field Forms**. Field forms are set up by prompting you for desired components. The default for the prompt is usually **Y** (yes).
- ❖ Select **<Enter>** to accept the default (**Y**) to generate a field form. **N** will terminate the program.
- ❖ The next screen will look similar to this:

```
***** FLDFORM *****
Revision NWIS-4.3.2-20030527
U.S. Geological Survey
Water Resources

Select Field Form Template Name (A): _____
```

- ❖ If a template exists that you want to use, enter the name at this prompt.
- ❖ If a template does not exist enter a filename for a new template at the prompt. The program will respond with:

```
Do You Want to Try Another One? N
*****File Does Not Exist*****
```

- ❖ By accepting the default (**N**), the program will prompt:

```
Do You Want to Create a New Template? Y
```

- ❖ By accepting the default (**Y**), the program will prompt for the components that are to be included on the form. Valid responses for the prompts include:
 1. **Y** – accept this selection (default)
 2. **N** – decline this selection
 3. **Q** – quit specifying component selection and start over

- ❖ Record types (Sitefile, CONS, MISC, etc.) are displayed beginning with the Sitefile and progressing through the ground-water record types; if you type **Y** for the displayed record type, individual components within the record type will be prompted for inclusion on the form. You also can specify the number of blank lines for components where multiple entries are possible.
- ❖ Continue this process until all desired components are selected. The program then asks if you want to Output a Field Form. Typing **N** to the prompt, **“Do You Want to Create a New Form?”** will start the process over at the prompt for creating field forms.
- ❖ Once a template has been populated with the selected components, you are prompted to output the field form. To save the field form select **<Enter>** or **Y**. If for some reason the field form should not be saved type **N**, and the program is then terminated.
- ❖ If you select **<Enter>** or **Y**, processing continues and you are prompted for the output filename:

Select Form Output File Name (A): f.username.001_____

The default name format is shown, f.username.XXX, where username is the user's ID and XXX is a sequence number.

- ❖ The program will prompt for site IDs to use in the field form you have created or selected. If you have a file containing the site IDs answer **Y** (the default is **N**) and input the filename.
- ❖ If you do not have a file containing a list of site IDs, answer **N**. The program will prompt for site IDs. To enter more than one site ID answer **Y** at the prompt: **“Site Finished Output Another One? N”**. Continue until all site IDs are input.

Note: To create a blank field form for a **new site, leave the “Select a site” prompt blank and** hit **<Enter>**.

- ❖ Print the file saved above, to have paper copies of your field forms to use in the field.
- ❖ Once a field form template has been created it can be reused by simply entering the name of the template at the prompt and entering the site IDs as described above.

16.12 Tip Sheet: How do I find a geologic unit code?

- ❖ Choose option 91 from the main GWSI menu – **Utilities Menu.**
- ❖ Choose option 3 from the Utilities menu – **Query Support Files.**
- ❖ Choose option 3 from the Support Files menu – **List Geologic Unit Code by Code or Name.**
- ❖ The next screen that appears will look similar to:

Geologic Unit Name and Code Retrieval Routine

Options for Retrieving Geologic Unit Name or Code:

- 1 -- Retrieve/Select a Geologic Unit by Code
- 2 -- Retrieve/Select a Geologic Unit by Name
- 3 -- Select a Country and State (no state will list all matches)

- 0 -- Quit

What do you want to do (0-3)?

- ❖ Options 1 and 2 will result in the display of the Geologic Unit Code and Name for any Country and State in the database.
- ❖ For option 1, enter the eight-character Geologic Unit Code at the prompt. For example, if the Geologic Unit description for “211ALVL” is desired:

Enter 8-character geologic unit code: 211ALVL

GEOLOGIC
UNIT CODE NAME

211ALVL ALLEN VALLEY SHALE OF INDIANOLA GROUP

Note: If the geologic unit code entered matches more than one geologic unit in different states, the program will only display the first unit found in the master file, the nationwide list of geologic units associated with that code. The first unit may or may not be the one for your state.

- ❖ For option 2, enter either the specific Geologic Unit name or partial Geologic Unit name. This partial search will only work for names that start with the search criteria. For example, typing in “alle” will result in the following list of Geologic Unit Codes and their description:

```
What do you want to do (0-3)? 2

Enter geologic unit name: alle

GEOLOGIC
UNIT CODE  NAME

211ALVL    ALLEN VALLEY SHALE OF INDIANOLA GROUP
211ARDG    ALLEN RIDGE FORMATION
324ALGN    ALLEGHENY FORMATION
324ALPV    ALLEGHENY AND POTTSVILLE GROUPS, INDIFF.
337ALMN    ALLEN MOUNTAIN LIMESTONE OF MADISON GROUP
341ALGP    ALLEGRIPPIS SANDSTONE MEMBER OF CHEMUNG FORMATION
371ALNN    ALLENTOWN DOLOMITE
```

- ❖ The user can restrict Geologic Unit selection to Country and State by using option 3. The country and state chosen will be displayed on the “Options for Retrieving...” line. Use the FIPS code when entering the State selection.
- ❖ To restore selection of geologic unit codes or names from all countries and states, select “3” from the menu, and type in a carriage return (<CR> = none).
- ❖ To exit the program, select “0” from the menu.

For a complete list of all geologic unit codes use:

http://nwis.waterdata.usgs.gov/nwis/help/?read_file=nwis_aquifer_codes&format=rdb

For more information about geologic unit codes, visit the [USGS National Geologic Lexicon Database](http://ngmdb.usgs.gov/Geolex/geolex_home.html) at: http://ngmdb.usgs.gov/Geolex/geolex_home.html.

16.13 Tip Sheet: How do I use a prompt list and why would I want to?

A prompt list can be used to enter data into GWSI. The prompt list is user-defined and is best used for repetitive data entry such as water levels. The prompt list will query for only those fields included in the prompt list file. This tip sheet includes the basic steps needed to create and use a prompt list. The example used in this tip sheet is for entering water-level data. For more information on creating and using a prompt list file, please refer to [Section 4.3.1](#) of the GWSI User's Manual. Setting up a prompt list will streamline the data entry process by only including those fields that will be populated during data entry. Remember that all mandatory fields must be included.

- ❖ To create a prompt list file, you can begin by selecting **1: Query Entry** or **2: Screen Entry** from the main GWSI menu.
- ❖ At the following prompt enter **Y** to indicate you would like to use or create a prompt list.

Do You Want to Use a Prompt List? **Y**

- ❖ At the next query enter a new filename for the prompt list you are creating. It is helpful if the filename relates to the function of the prompt list you are creating.

Select Prompt List to Use or Create (A): **waterlev.prompt**

- ❖ For a new prompt list the following query and message will appear:

Do You Want to Try Another One? **Y**
*****File Does Not Exist*****

- ❖ At this prompt enter **N** to create a new prompt list; then enter another **Y** to create the new file.
- ❖ The next query will ask if you want to include any fields for General Site Data. For this example we are setting up a prompt list for entering water levels so the answer to this query is **N**. The same is true for Construction Data, Miscellaneous Data, Discharge data, etc.

Do You want to prompt for General Site data (Y,N,A,Q): **N**

- ❖ The only prompt you should answer **Y** to is the following:

Do You want to prompt for Water-Level data (Y,N,A,Q):**Y**

- ❖ The valid entries for this query are: **Y – Yes** - you will be allowed to select the specific fields within the General Site Data group to include in the prompt list; **N – No** - the entire section of General Site Data will be excluded from the prompt list; **A – Add** – a prompt for this field will only appear if data has never been added to this field. ; **Q – Quit** – will end the prompt list entry program.

- ❖ When setting up a prompt list for water levels, the following 11 prompts are available for set up:

Do You want to prompt for Water Level from LSD (Y,N,A,Q): **Y**

Do You want to prompt for Water Level from MP (Y,N,A,Q): **Y**

Do You want to prompt for Water Level from Vertical Datum (Y,N,A,Q): **Y**

Do You want to prompt for Status (Y,N,A,Q): **Y**

Do You want to prompt for Method of Measurement (Y,N,A,Q): **Y**

Do You want to prompt for Reference (Y,N,A,Q): **Y**

Do You want to prompt for Accuracy (Y,N,A,Q): **Y**

Do You want to prompt for Source (Y,N,A,Q): **Y**

Do You want to prompt for Party ID (Y,N,A,Q): **Y**

Do You want to prompt for Source Agency (Y,N,A,Q): **Y**

Do You want to prompt for Web-ready Flag (Y,N,A,Q): **Y**

Note: If you do not want data entered for any of the above non-mandatory fields, the response should be an 'N'. Users should be careful to specify all fields needed for valid record entry when creating a prompt list. For example, several fields are mandatory to enter a [water-level record](#), some of which can be populated with default values (for example, source agency (C247) usually defaults to "USGS" and method (C239) defaults to "S"). If default values can be used, mandatory fields are not selected to be part of the prompt list. These fields will be populated with the default value without any input or review from the user. If the user intends to populate a field with any value other than its default, then he or she must specify that field to be included in the prompt list.

- ❖ Once all the queries have been answered, the prompt list that you created can be used immediately to enter data, or you can exit the program and use the prompt list at another time.
- ❖ To use a prompt list created in a previous session, enter the name of the existing prompt list file at the following prompt:

Select Prompt List to Use or Create (A): **waterlev.prompt**

- ❖ At the end of entering data for one site, the following query will appear. If you answer **Y** you can use the same prompt list for additional sites:

Another Site? (Y or N): **Y**

- ❖ After you have entered all data for all sites, you will have created an input file that can be processed into the database. For instructions about how to complete this step refer to [Chapter 6 and Chapter 7](#) of the GWSI User's Manual or consult with your local GWSI DBA.

16.14 Tip Sheet: Why didn't I get the expected data in my GWSI retrieval in NWIS 4.4 and beyond?

- ❖ In NWIS 4.4, the default retrieval will restrict the output results to those that are identified as web-ready. This applies to all web-ready flags. This new restriction option was implemented to satisfy security concerns to keep sensitive data from being inadvertently released.
- ❖ A new option (option 7) was added to the 'Current limitation to site selection' option list:

```
****GWSI Retrieval Restrictions Have Been Implemented.****
****Please review Option 7 below. ****

Current limitations to site selection -

(1) Polygon: Sites are not restricted by latitude-longitude polygon
(2) Detail tests: Sites are not restricted by detail testing
(3) Site types to be included: (SP) Spring
                               (GW) Ground water other than spring
(4) Maximum number of sites to retrieve by gross select (0=no limit): 0
(5) Max no sites to pass polygon, detail & type tests (0=no limit): 0
(6) Maximum number of records to output for tabling (0=no limit): 0
(7) Retrieval restriction options: A) Exclude Sites/Data Not Available on Web

Enter item number to change, R to re-list items or <CR> to continue:
```

- ❖ Several restriction options are available if you need to change the default setting:

```
Enter item number to change, R to re-list items or <CR> to continue: 7
Enter restriction options (<CR>=ALL Restrictions): ?
Restriction options are (-,P,L,N,A):

-) No Exclusions, Retrieve All Sites/Data
P) Exclude Proprietary Sites/Data
L) Exclude Local Use Sites/Data
N) Exclude Sites/Data Failing Checks
A) Exclude Sites/Data Not Available on Web

You may enter more than one exclusion option.

Enter restriction options (<CR>=ALL Restrictions):
```

Note: Choosing the '-' (dash), No Exclusions, option will return the traditional output.

- ❖ The default setting - option A - limits output to those values which have a web-ready flag that indicates it is ready for public display. This applies to all web-ready flags, not just the Sitefile web-ready flag. **Option A applies all restrictions to a retrieval.**
- ❖ A web-ready flag is controlled by whether or not the data are proprietary, local use, or have passed data checks.
- ❖ Water-quality data that are retrieved through GWSI will also be subject to any retrieval restrictions related to the [Data Quality Indicator \(DQI\)](#).

- ❖ Control files from previous versions of NWIS will work, but will use the default option A. This means that these files may result in unexpected output.
- ❖ More than one restriction option may be entered. This allows users to combine the middle three options (L, P, and N) in any combination desired.

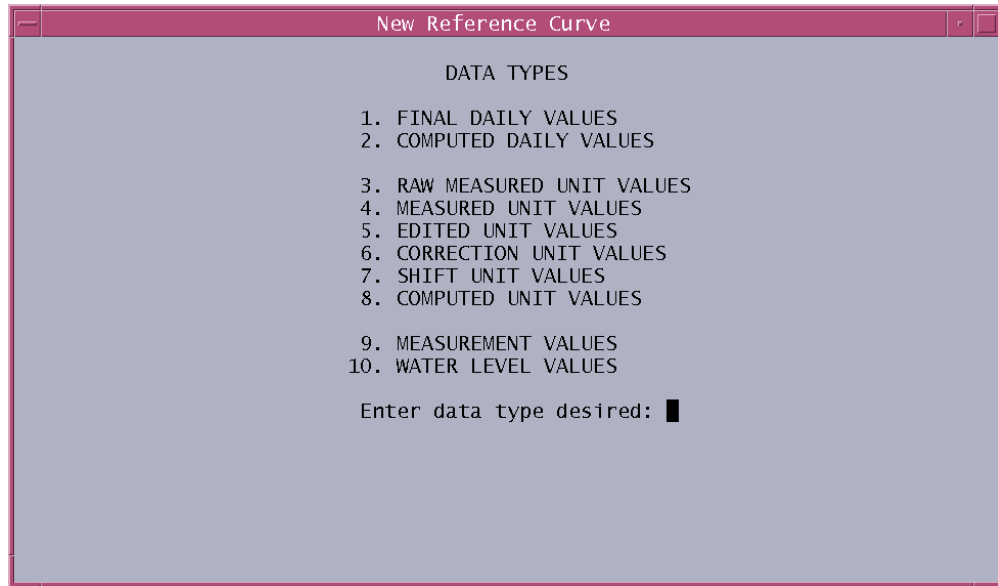
6.15 Tip Sheet: Viewing Continuous and Discrete Ground-Water Data in Hydra

- ❖ This Tip Sheet briefly describes the use of Hydra, an ADAPS program, to view continuous and discrete ground-water data concurrently. Hydra also can be used to edit continuous ground-water levels, but that aspect of the program is beyond the scope of this Tip Sheet. Novice Hydra users should ask an experienced user for help in the use of Hydra or refer to the [Hydra User's Manual](#).
- ❖ This Tip Sheet assumes that the user knows how to start ADAPS and invoke Hydra to view and edit unit values. The user must use Reflection X or another program that allows graphic windows from UNIX to be displayed on the desktop to connect to the NWIS server on which the data are stored.
- ❖ Discrete ground-water levels may be viewed separately by use of the [Hydrograph Program](#) of GWSI.
- ❖ If you specified the parameters of the “study curve” on the TS_EDIT page of ADAPS, these data should appear right away in the Graph window of Hydra. Other data, whether from the ADAPS time-series files, the peak-flow file, the ADAPS measurement file, or the GWSI water-level table, can be added as “reference curves.”
- ❖ To load water levels from GWSI as a reference curve for your session, click on File => Reference => New in the Control window. The NWIS2RDB screen shown below will appear, from which you can select the data you wish to plot.

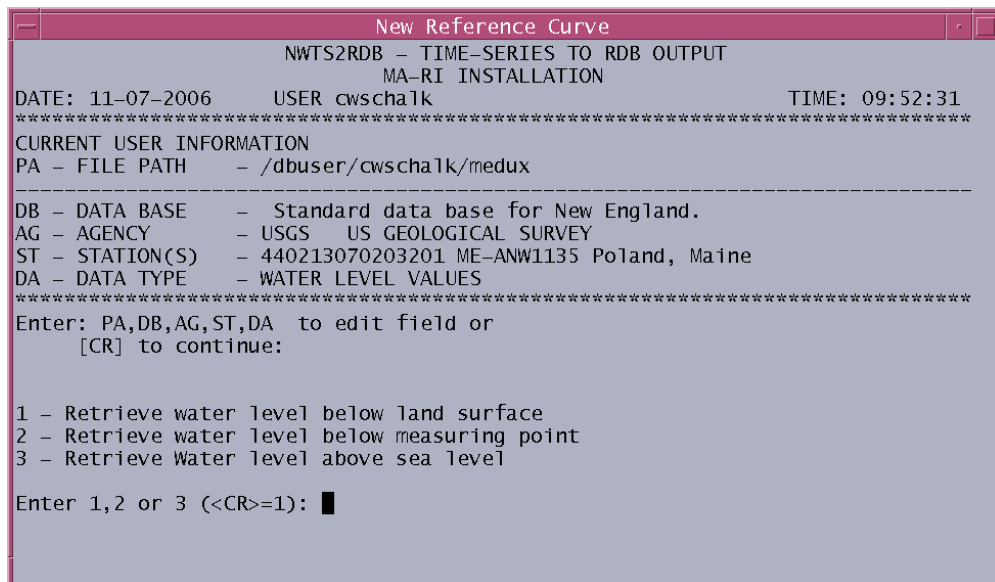
```

New Reference Curve
NWTS2RDB - TIME-SERIES TO RDB OUTPUT
MA-RI INSTALLATION
DATE: 11-07-2006   USER cwschalk   TIME: 09:49:14
*****
CURRENT USER INFORMATION
PA - FILE PATH    - /dbuser/cwschalk/medux
-----
DB - DATA BASE   - Standard data base for New England.
AG - AGENCY       - USGS   US GEOLOGICAL SURVEY
ST - STATION(S)  - 440213070203201 ME-ANW1135 Poland, Maine
DA - DATA TYPE  - EDITED UNIT VALUES
DD - DATA DESCR. - WaterLevel, BelowLSD, IN feet
*****
Enter: PA,DB,AG,ST,DA,DD  to edit field or
      [CR] to continue: █
    
```

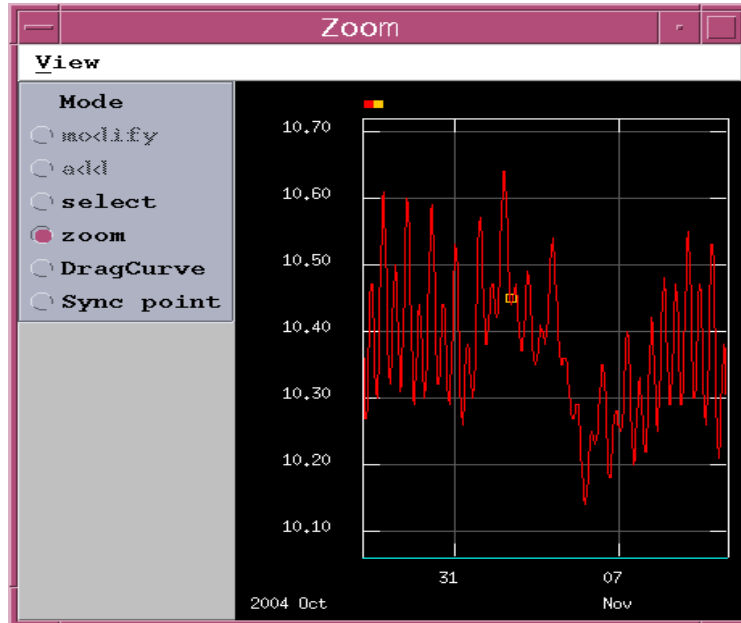
- ❖ If you want discrete water levels for the same well whose continuous data are shown in the study curve, do not change the station. However, you need to change the data type. Type “**DA <enter>**.” The following screen (next page) will appear, from which you should choose option 10 (water level values). Note that you cannot change the date range of the reference curve; it will be of the same range as the study curve. [Note that if the period that you are viewing does not contain any discrete water-level measurements, then no markers will appear.]



- ❖ When you have selected water levels as a reference curve, the program will then ask you whether you wish to see water levels below land surface, water levels above the vertical datum (or sea level), or water levels below measuring point. *You cannot retrieve more than one type of water level as a single reference curve.* Although GWSI allows users to store data as different types of water levels and will convert between the three on output, if desired, Hydra will not; therefore if your data are stored as “below land surface” in GWSI, you can view them only as “below land surface” in Hydra. If you choose an option for which no water levels exist, Hydra will “load” your selection as a reference curve, but no markers will appear.



- ❖ When you have selected the type of water level, the reference curve will be loaded into Hydra, and you will see the discrete values as a “curve” of a new color (example of the Zoom window below). Because this reference curve consists of discrete values, it will appear as if the curve is simply zero or more points that appear at the correct locations in relation to the study curve.



- ❖ Water levels having partial dates (C235) or no times (C709) may be stored in GWSI. The water-levels retrieval module for Hydra converts C709 (local time) to Greenwich Mean Time (UTC) by use of the tz_cd and local_time_fg from the Sitefile, and then to the time datum of the Hydra session (the time datum of the first unit value in the curve being edited). The explanations for time and date considerations are documented in Hydra by going to "View =>Point Measurement Remarks" in the Control window.
- ❖ Regarding partial dates: Year cannot be missing from C235. If somehow it is missing, the water level will not be included in the retrieval. If the month is missing from C235, Hydra uses '01/01 00:00:00' (January 1 of the year) and tags it as "M" in the remarks column. If the day is missing, Hydra uses '01 00:00:00' (first day of the month) and tags it as "D" in the remarks column. If the time (C709) is missing, Hydra uses '00:00:00' (midnight) and tags it as "T" in the remarks column.
- ❖ If setting a partial date using the above rules results in a duplication of another existing full date/time, Hydra increments the time by one second and tags it as "I" in the remarks column.
- ❖ You may choose to zoom to a smaller time increment; this may be done by dragging a box in the Graph window to cover the time period of interest. The details will appear in the Zoom window, from which you may zoom even closer.
- ❖ The functionality of Hydra is such that you may choose to save your session, edit the values of your study curve, or do many other actions. Users who wish to know more about Hydra, including how to save files or sessions, how to customize settings or workspaces, or how to edit data appropriately by use of Hydra, should refer to the [Hydra User's Manual](#).

16.17 Tip Sheet: Batch-Load Your GWSI Data from Spreadsheets

This Tip Sheet describes the use of SWUDS (Site-Specific Water-Use Data System) to batch-load GWSI data that have been (or will be) entered into Excel © spreadsheets. SWUDS provides two primary tools to GWSI users: a spreadsheet template builder and a batch-loading tool. The template builder creates Excel © spreadsheets that are based on GWSI tables and can include reference lists and a data dictionary for most GWSI tables. The batch loader converts spreadsheet data into GWSI-ready files that can be copied to the user's NWIS server and processed through GWSI Main Menu options 3 and 4 (Edit and Update). SWUDS also provides a tool to retrieve SITEFILE information. That tool is not discussed in this Tip Sheet.

SWUDS is a standalone Windows program that reads from an NWIS installation by use of ODBC. Installation instructions are available at http://www.nwis.er.usgs.gov/pc-swuds_rel.html.

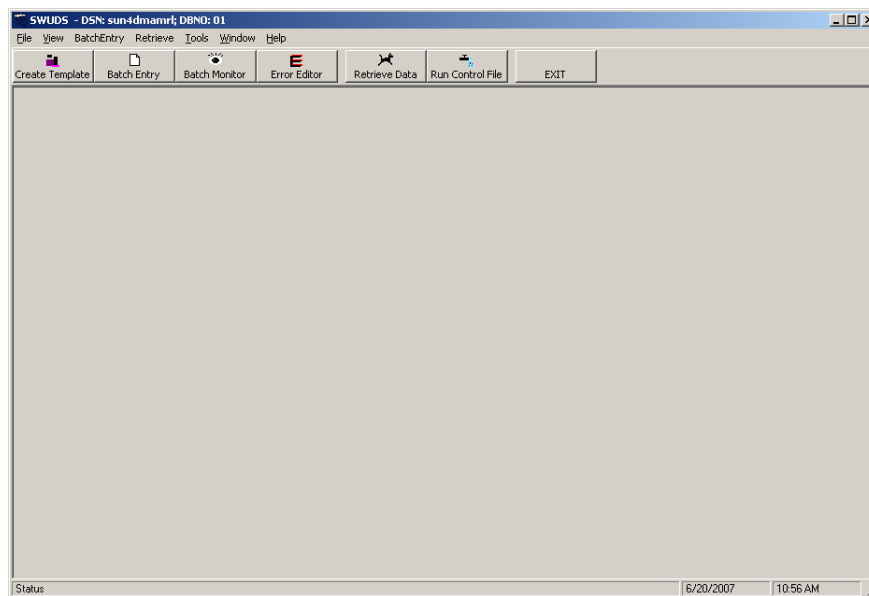
Initiate SWUDS from the Programs menu or by double-clicking its icon on the desktop.

For the purpose of this Tip Sheet, we will work with the water-level table, although spreadsheets can be created for any GWSI table individually or for many GWSI tables at once. The steps described apply to all GWSI tables.

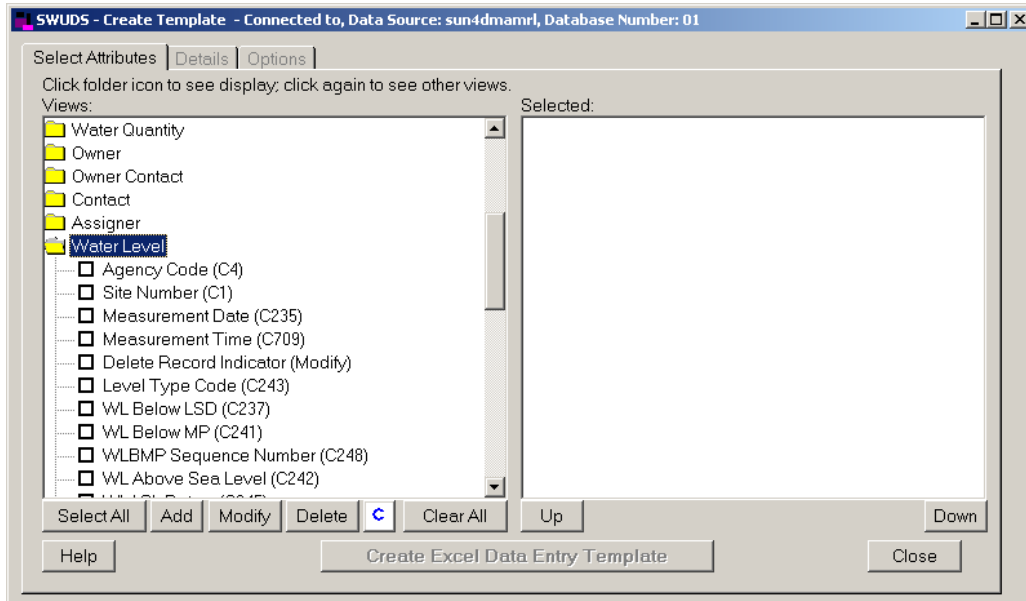
Note that you do not have to use spreadsheet templates created by SWUDS in order to batch-load data through SWUDS. You can use any spreadsheet, as long as you can tell SWUDS which fields are which. However, the advantage of using SWUDS-generated templates is enormous because SWUDS can map the columns in its spreadsheets to the correct GWSI fields without any intervention from the user. (More on this in the **Batch Load** section.)

Creating a spreadsheet template

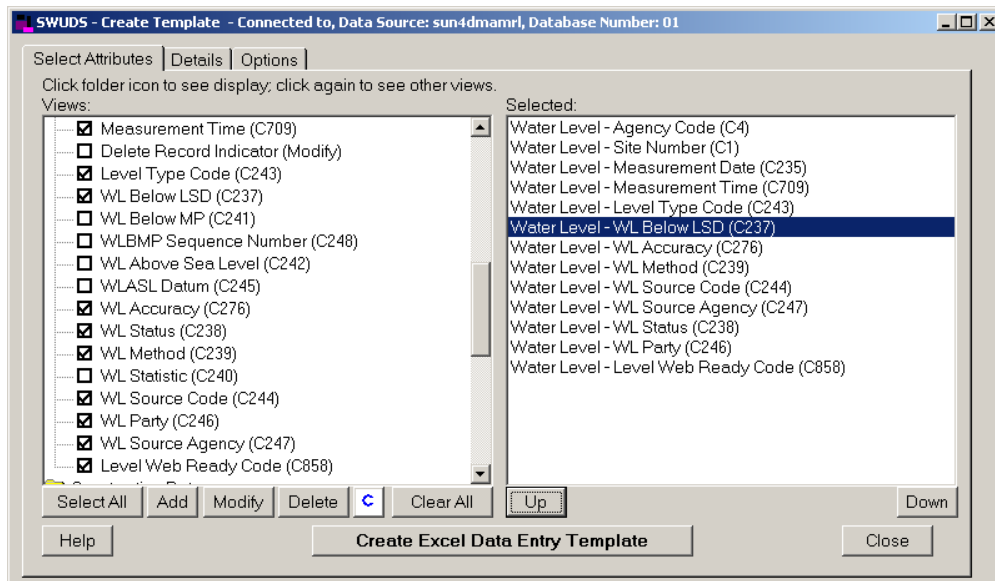
- ❖ Click on the Create Template button near the top of the SWUDS screen.



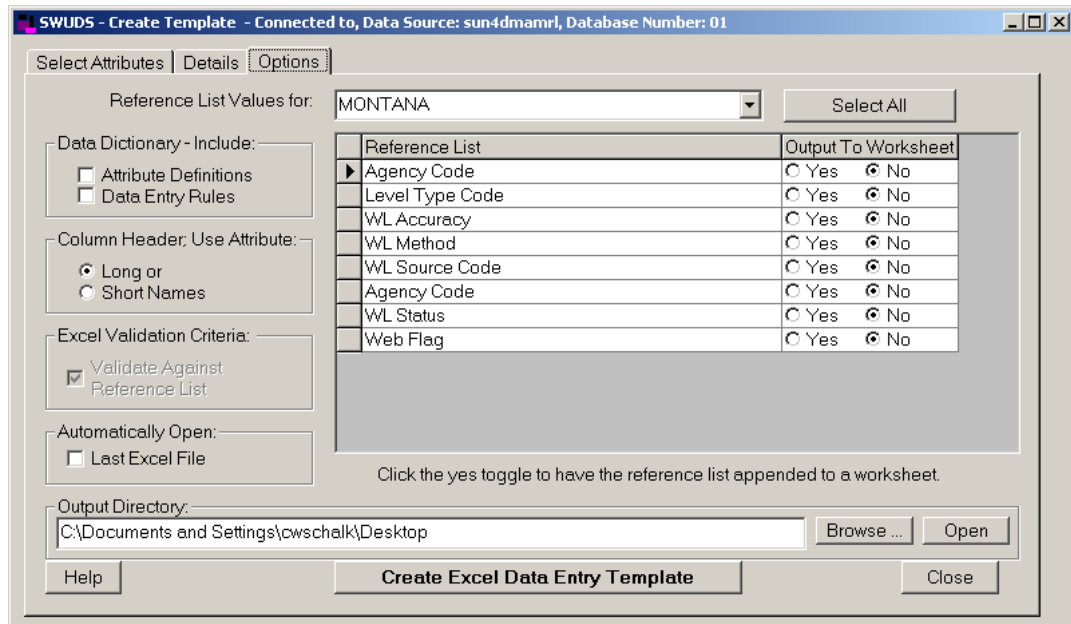
- ❖ After reviewing the tips that appear, click on the water-level view. Notice that all of the attributes available in the water-level table appear, but none are selected.



- ❖ Select the attributes that you want to include in your spreadsheet by clicking in the appropriate boxes. Notice that those attributes will be copied into the selected list on the right. *HINT:* The Add button will select all attributes that are mandatory to create a water-level record, but you will have to select Time (C709) and your chosen water-level type (below LSD, below MP, above Sea Level) manually. We will suppose that you want to enter water levels below LSD, so your selected attributes might be as shown below. *HINT:* The blue C button will add all the attributes that are conditionally mandatory for a water-level record.



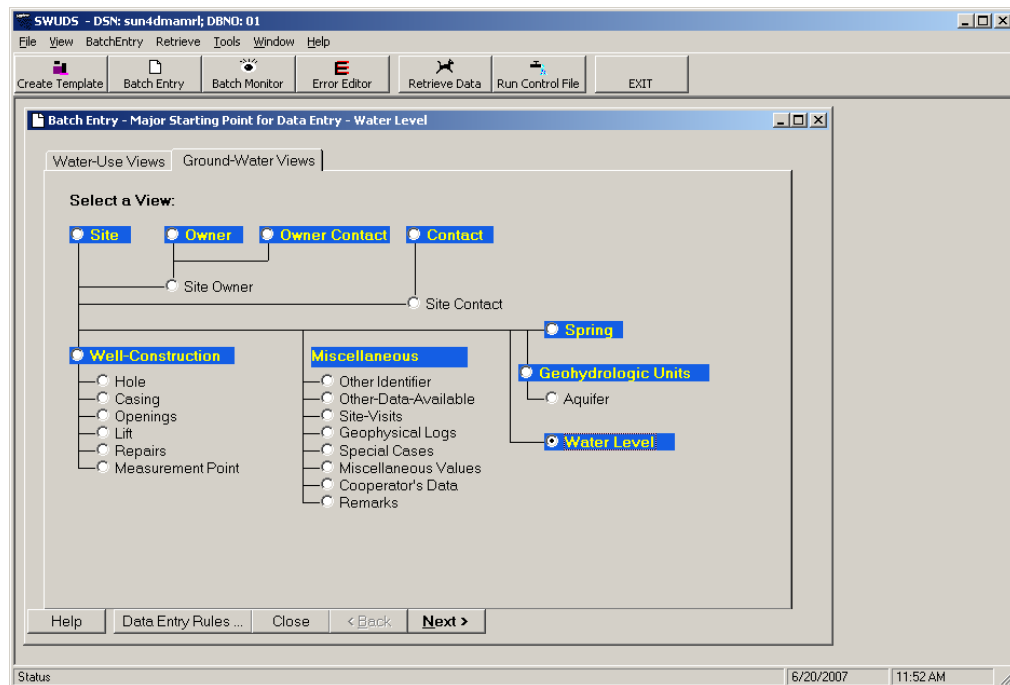
- ❖ Note that SWUDS can be used to delete or modify data as well, although we will not discuss those operations in this Tip Sheet. If you wish to use SWUDS to delete records, you must include the Delete Record Indicator with the template. *Use the Delete and Modify functions with caution; they will be done in batch mode and you will be given no opportunity to verify them before they happen.*
- ❖ You can use the information on the Details tab to review the attributes you selected. For now, click on the Options tab.
- ❖ On the Options tab, you can choose to include reference lists in the spreadsheet you build; you can choose to include a data dictionary for this table; you can choose to ask Excel © to validate your entries against the reference lists it builds; and you can specify an output folder.



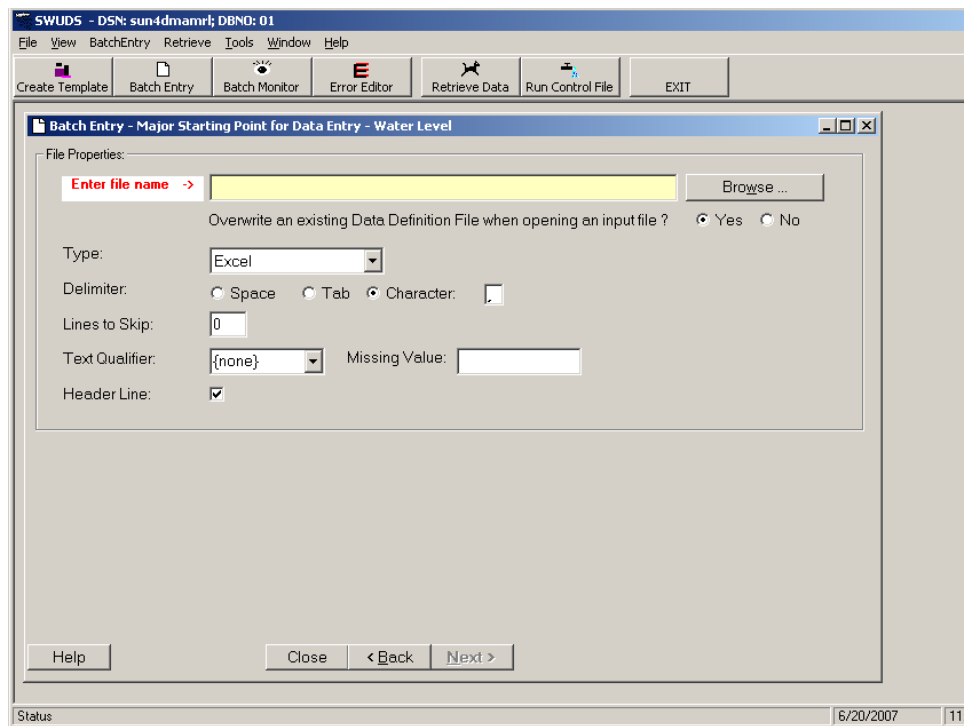
- ❖ Choose the State for which your spreadsheet applies. The reference lists that are built will vary according to State. You will be able to enter any data into your spreadsheet, however, regardless of whether you have reference-list data that correspond. *HINT: You can specify a certain State by default from the Tools/Preferences menu of the main SWUDS screen.*
- ❖ To include all available reference lists in your spreadsheet, click the “Select All” button beside the State name. Notice that the “Yes” radio buttons will be highlighted in response.
- ❖ Click the desired options on the left side of the Options screen. You may choose to include a data dictionary, use long names rather than short names, and ask Excel © to validate values against the reference list. (This last option will be available if at least one reference list is selected.)
- ❖ Finally, click the Create Excel Data Entry Template button at the bottom of the screen. Browse to the desired folder and save the spreadsheet.

Batch Loading Data from a Spreadsheet Template

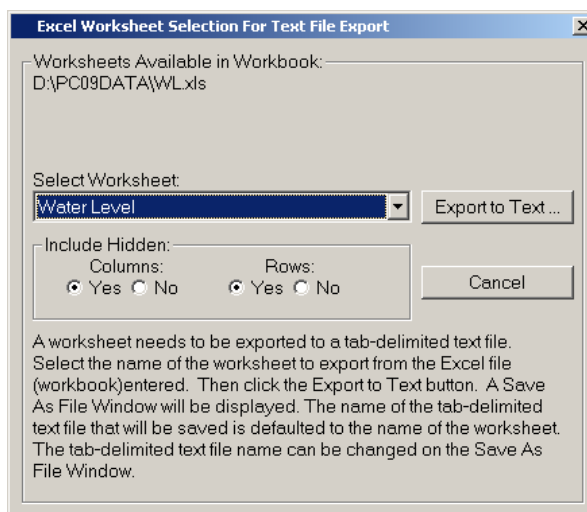
- ❖ Populate the spreadsheet template you created with water-level data. SWUDS does not have to be running as you work with the spreadsheet. *HINT:* You can copy data from another spreadsheet into the SWUDS-generated template as well. Note that the template provides reference-list codes and definitions, a data dictionary, and data-entry tips (such as formats; available when you hover over the column headers with your mouse). SWUDS also color-codes the columns to reflect those that are mandatory, conditionally mandatory, and optional. Reference-list codes are available by use of pull-down buttons for the appropriate columns.
- ❖ Save the data in the spreadsheet to a typical Excel © file (*.xls). Close the file if desired.
- ❖ *General information:* To add data for a new site, process the SITEFILE data first. No other GWSI tables can be entered until the SITEFILE information is in GWSI. In our example of entering water levels, we have assumed that the site is already established (the SITEFILE is populated for this site).
- ❖ Start SWUDS on your desktop. At the main menu, click on the Batch Entry button. Click on the Ground-Water Views tab. Highlight the Water Level radio button. Click Next.



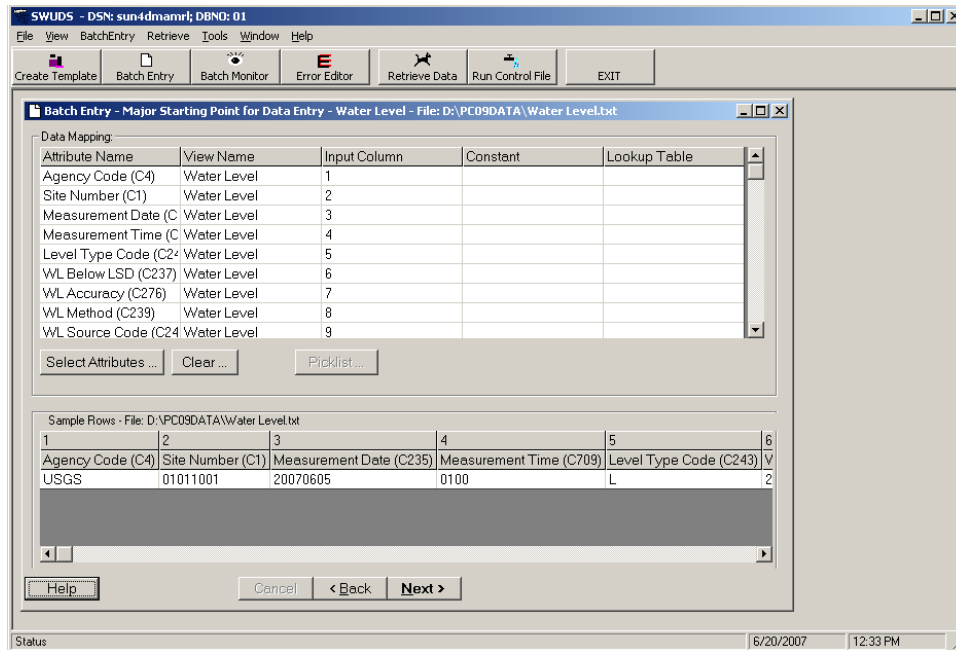
- ❖ Use this screen to provide information about the file (spreadsheet, in this case) being used to enter water-level data. SWUDS assumes the use of an Excel © spreadsheet by default, one header line, skipping no lines of data, and specifying no text qualifiers. Leave these defaults as is, for our example. Use the Browse button to locate the spreadsheet of data.



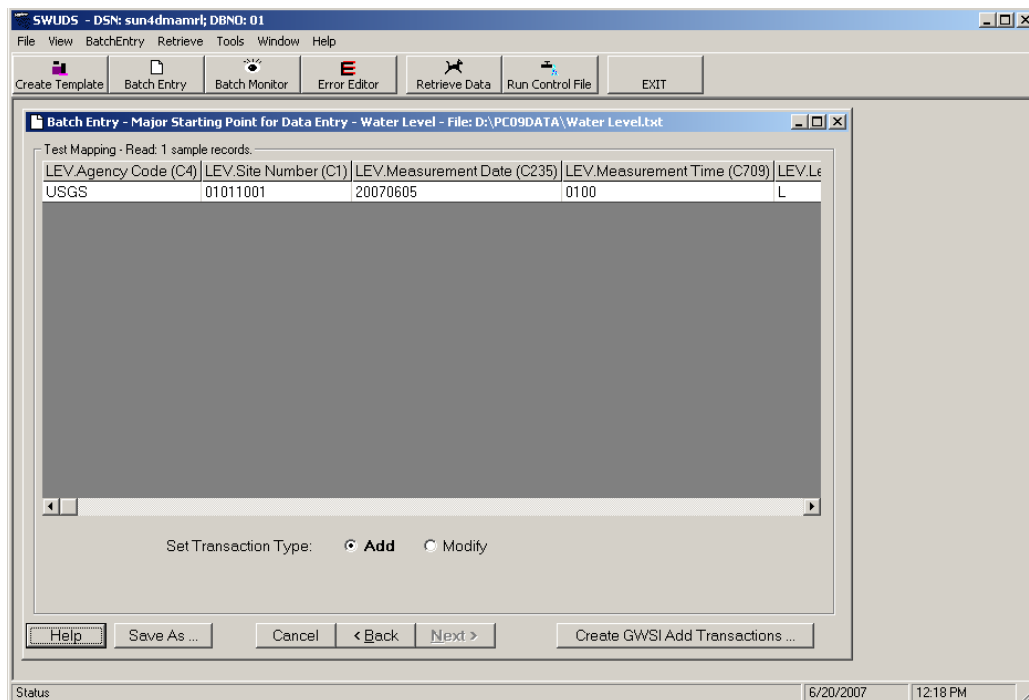
- ❖ When SWUDS creates GWSI input files, it must use ASCII text; consequently, this step allows SWUDS to convert the data in the spreadsheet to a text file. Because we created a spreadsheet template for one table (Water Level), we don't need to tell SWUDS which worksheet in the spreadsheet to use. Had we created a spreadsheet template containing several tables (such as SITEFILE, Water Level, and Construction), we would have to tell SWUDS which worksheet to use. Each worksheet must be converted individually to a text file if your spreadsheet has multiple worksheets, and the subsequent batch-loading steps processed for each text file, one at a time. In our example, leave the defaults as they are and click Export to Text. Browse to the appropriate location and click Save.



- ❖ Notice that SWUDS now displays the column headers and several rows of water-level data at the bottom of the screen. Examine the rows to see whether the data are correct. Then click Next.
- ❖ This next screen displays the column-to-attribute mapping that SWUDS requires. In our example, SWUDS maps the columns automatically because we used a SWUDS-generated spreadsheet template for our data. *If you do not use a SWUDS-generated template, you may have to tell SWUDS what attributes you are loading (by use of the Select Attributes button) and map the columns by hand (populate the Input Column value for each attribute).*



- ❖ You can override the value of any attribute in your spreadsheet with a constant value of that attribute (for all records) by entering a value in the Constant column for the appropriate attribute. For example, you may not have bothered to enter “USGS” as the agency code for each record in the spreadsheet; however, you can ensure that all records use “USGS” as the agency code by entering “USGS” as the constant value of Agency Code.
- ❖ When you are satisfied that SWUDS has mapped the spreadsheet columns to the correct attributes, click Next.
- ❖ The final screen of the Batch Loader is shown below. By default, SWUDS assumes this is to be an add transaction; that is, you will be adding new records to GWSI. If you are modifying or deleting records, highlight the Modify radio button. *Be cautious when specifying Modify and Delete transactions in batch mode!* When you are satisfied that the correct transaction type is selected and the data are correct, click Create GWSI Add Transactions. Browse to the correct location and save the file.



- ❖ Congratulations – you have used SWUDS successfully to generate a GWSI input file! From this point, follow your office’s typical procedure to load the data into GWSI. (Usually this task is done by the ground-water database administrator or equivalent.)