

3.4 Option 4 -- Data Output

Option 4 of the main menu accesses a submenu with options to output data **(1)** in tables for publication in reports, **(2)** in files that can be loaded into other applications, and **(3)** in files that can be used for the P-STAT statistical package. Tables for publication and files that can be loaded into other applications can be retrieved in two formats: by-sample or by-result. Additional information about tabling options can be found in the Getting Started section. To retrieve any of these output formats, a file of record numbers is required, which can be produced using option 1 or 2 from the Data Output menu.

```
QWDATA PROCESSING ROUTINE  REV NWIS_4_0+20010319
YOU ARE USING WATER-QUALITY DATABASE NUMBER 01

Data Output

1 -- Select Sites and Samples
2 -- Select sites and Samples from Multiple Databases
3 -- Water-Quality Table by Sample (Publication Format)
4 -- Water Quality Table by Result
5 -- Flat File by Sample
6 -- Flat File by Result
7 -- Make a P-STAT Data Set
98 -- Exit menu
99 -- Exit system

Please enter a number from the above list or a Unix command:
```

Data Output Options

3.4.1 Option 1 -- Select Sites and Samples

[See description in Section 3.3.1.](#)

3.4.2 Option 2 -- Select sites and Samples from Multiple Databases

Water-quality data from as many as five databases may be retrieved, as shown on the following screen. The multiple database retrieval option is used, most often, when data must be retrieved from the environmental database and the quality-assurance database. Database numbers may be entered in any order. After the desired database numbers are entered, the user input is the same as that described in [Section 3.3.1](#). The output to the screen informs the user of the results of selections for each database specified by the user.

```
qwmdb_loc -- locate site numbers/qw records for multiple databases  
Enter up to 5 database numbers --  
  
(1) DATABASE NUMBER: __  
  
Options: ? ^D # / /x /+x /-x /@ /c /q -- Enter ?/ for help
```

User is prompted to enter database numbers when multiple databases need to be accessed

If selection criteria are used to retrieve a site list (option 3, below), a single set of criteria is used for all databases. After the sites are retrieved, the user is prompted to sort the list of sites and save a file for the list of sites from each database.

```
You may locate records for specific sites.  
  
If you wish to locate records for specific sites the options are:  
1 -- You have a file containing site numbers  
2 -- You will enter site numbers for each database at terminal  
3 -- You wish to locate sites based upon selection criteria  
  
If you don't care which sites the option is:  
4 -- Locate QWDATA records without regard to site  
  
Please enter option (1-4,Q to quit):
```

User may enter site numbers from a file, from the terminal, based on selection criteria, or may locate records without specifying site numbers

If water-quality records are retrieved, one file is output that contains the record numbers from all databases and a database number is attached to each record number to identify the location of the data ([Appendix G](#)). The user is prompted to save a list of sites that have water-quality data for each database.

3.4.3 Option 3 -- Water-Quality Tables by Sample (Publication Format)

This option is used to prepare tables of water-quality data in the format required by USGS for publication in the District Annual Data Report. Four table styles are available with Option 3 and Option 4 - Water Quality Table by Result.

1. **Single-station format:** Data for each station are tabled separately so that each new station starts at the top of a page. This is the most commonly used format for surface water-quality data published with streamflow gage record in the District Annual Data Report.
2. **Miscellaneous-station format:** Data for all stations are tabled together. Each new set of parameters begins at the top of a page. Station numbers, names, and latitude/longitude are printed on a single line that precedes the data for that station. This is the most commonly used format for publishing miscellaneous records of surface water-quality.
3. **Multiple-station format:** Data for all stations are tabled together in sequence just as for the Miscellaneous-station format. Station numbers and dates, if requested, are printed in the first columns of the table. This is the most commonly used format for miscellaneous ground-water data.
4. **Biologic data format:** Data for each station are tabled separately so that each new station starts at the top of a page. For each sample, the output tabulates the taxonomic biological identification, counts, and percent of population. This format was developed for and used to display data produced during the 1970's and early 1980's by the biologic section of the Atlanta Central Laboratory.

3.4.3.1 Specify the Sample Records for Tabling

After selecting option 3, the user is asked to provide the name of the file that contains the list of record numbers to be tabled. This list is usually generated by the Select Sites and/or Samples -- [section 3.3.1](#) option or Select Sites and/or Samples from multiple databases -- [section 3.4.2](#). A list also may be created with an editor [Appendix G](#). Each 8-digit record number is entered on a separate line, beginning in column 1. If the records are from multiple databases, the database number is a 2-digit number in columns 9 to 10. After the input file is identified and opened, the user must provide the name of a file that will contain the output table. If the specified output file already exists, the user may replace the data in the file (overwrite), leave the file intact and add the new table to the end of the file (append), or type in a new file name.

Enter name of file to hold output –
: std.table
That file already exists
Do you wish to re-use that file (Y/N)? y
Do you wish to over-write or append (O/A)?

User is prompted to provide the name of a file that will contain the output table

3.4.3.2 Specify the Table Definition

The user assembles a "table definition" by selecting a table type and specifying output options. The table definition sets up the specification parameters that determine the table format. The table definition may be entered from an existing table definition file or may be specified by answering several queries. If yes is entered, the user is prompted to enter the file pathname. If the specified table definition file exists, the table definition is retrieved and displayed. The user is asked if this is the desired definition and if so, are changes to be made to the definition.

If no existing definition is to be used, the following screen is displayed:

TABLE TYPE (1,2,3,OR 4):
DELETE COLUMN IF NO DATA (Y OR N): Y PRINT PARAMETER CODES (Y OR N): Y
LINES PER PAGE: 90 FOLDING OPTIONS (0,1,2,OR 3): _
REMOVE HEADING LINE (Y OR N): N

Table definition screen allows the user to select from formatting options for tables output in publication format

If uncertain about the meaning of a field on the screen, an entry of question mark (?) will produce an explanation of the field and the effect of each option to be displayed; the cursor then returns to the same field for entry of the option value.

TABLE FORMAT (MANDATORY):**OPTIONS:**

- 1 -- Single Station.
- 2 -- Miscellaneous Station.
- 3 -- Multiple-Station.
- 4 -- Biologic Data.

PLEASE ENTER 1, 2, 3, OR 4:

When a "?" is entered in the table type field, a list of field options is displayed to the screen

After the table type code is entered, default options are placed after the colon (:) in each succeeding field. A carriage return is entered to accept the default value.

- **TABLE TYPE (1,2,3,OR 4)** : Examples of each table type are found in [Appendix C](#).
- **DELETE COLUMN IF NO DATA (Y OR N): Y** : If none of the selected samples contain a result for one of the requested parameters, the columns associated with that parameter will be removed entirely unless an "N" is entered here. In that case, the column headings will be retained and the no-value indicator of "--" will be printed for each analysis (N).
- **PRINT PARAMETER CODES (Y OR N): Y** : Parameter codes will be included with the parameter name in the column headings unless an "N" is entered.
- **LINES PER PAGE: 90** : This determines the number of lines printed per page of output. The default page length of 90 lines produces a page with the proper proportions for reduction to the standard District Annual Data Report page size. To modify the 90 lines per page, enter the appropriate number of lines, left-justified.
- **FOLDING OPTIONS (0,1,2, OR 3)**
 - ⇒ 0 -- No folding, applicable to all table types
 - ⇒ 1 -- Horizontal folding, 24 to 100 parameters per page, applicable to type 1 tables only
 - ⇒ 2 -- Horizontal folding, 11 to 100 parameters per page, applicable to type 1 and type 3 tables only
 - ⇒ 3 -- Vertical folding, maximum of 5 parameters (including date), applicable to type 1 and type 2 tables only

- **REMOVE HEADING LINE (Y or N):N** : The top line of the table will include a heading line with the District code, "United States Department of Interior - Geological Survey," and processing date unless a **Y** is entered here.

Each table type results in a different list of formatting options. Additional fields may appear as options depending on the table type selected.

If table type 1, Single-station format is selected, two additional fields, **REPORTING YEAR** and **TABLE TITLE** are added to the screen.

- **REPORTING YEAR (W=WATER,C=CALENDAR,BLANK=NO BREAK)** : Allows the user to specify if page breaks with new headings should occur or should be suppressed at changes in the water year or calendar year. A **<cr>** enters the default (blank) and suppresses a page break.
- **TABLE TITLE:** Allows the user to select any of the following standard titles to be placed on each page of the table. There are 13 table titles available:

Table title selections	Title text
0	WATER-QUALITY DATA
1	CHEMICAL ANALYSES
2	PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT
3	PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL
4	SUSPENDED SEDIMENT DISCHARGE
5	SPECTROGRAPHIC ANALYSES
6	RADIOCHEMICAL ANALYSES
7	PESTICIDE ANALYSES
8	WATER LEVEL, IN FEET, BELOW LAND-SURFACE DATUM
9	ELEVATION IN FEET, NGVD
A	WATER LEVEL, IN FEET ABOVE OR BELOW LAND-SURFACE DATUM
X	WATER LEVEL, IN FEET ABOVE OR BELOW LAND-SURFACE DATUM
Z	ENTER YOUR OWN HEADING (80 CHARACTERS MAXIMUM)

Table titles that may be selected for publication style tables

Selection **Z** allows the user to supply any title text up to 80 characters. When **Z** is selected "**TITLE:**" is displayed, and the user can enter the desired text.

Once the table definition has been defined for table type 1, processing passes to the next step -- storing the table definition.

When table type 2 is selected (miscellaneous-station format), available fields are the same as for a [type 1 table](#), and processing passes to the next step -- [storing the table definition](#).

When table type 3 is selected (multiple-station list format), 7 additional fields are added to the table definition screen shown for a type 1 and type 2 table:

▪ **COUNTY SKIP OPTION:** _

- **0** -- No skip; table is not sorted by county (default).
- **L** -- Sort by county; place 3 blank lines between counties; do not print county name.
- **P** -- Sort by county; place a page break between counties; do not print county name.
- **Q** -- Sort by county; place 3 blank lines between counties; print county name.
- **R** -- Sort by county; place a page break between counties; print county name.

Note: *The alpha parameter code CNTYC must be included in the parameter list to use this option. If CNTYC is the last parameter in the list, county codes are used but not included in the table. If one of the skip options is invoked and CNTYC is not in the parameter list, it is added as the last parameter in the parameter code list.*

- **LEFT-ADJUST LOCAL ID (Y OR N):N** This is applicable only if the alpha parameter LOCAL is included in the parameter list; the local identifier (usually well number) may be left-justified under the column heading (**Y**) or printed verbatim with any blanks that may be included in the Site File retained (**N**).
- **PRINT DATES (Y OR N):Y** A column containing sample dates is printed unless the **N** is entered. If the alpha parameter DATES is not included in the parameter list, it is added automatically after the last alpha parameter.
- **CENTER STATION ID (Y OR N):N** option affects the alpha parameters STAID (station number) and SNAME (station name). These values may be centered under their column heading (**Y**) or printed exactly as they are found in the Site File, with any blanks retained (**N**).
- **REPEAT DUPLICATE ID'S (Y OR N):N** Values for sample identifiers STAID (station identification number), LOCAL (local station identifier), and/or LATLG (latitude-longitude) are printed for only the first line in a group of samples with the same ID. Samples must be sorted on one of these fields. These values may be printed for every sample by entering **Y**.
- **SKIP A LINE ON CHANGE OF STATION (Y OR N):N** A blank line is inserted between every 5 analyses, regardless of station number. To have a blank line also inserted between each new station number, enter **Y**. This option is valid only if the records numbers are sorted by the alpha parameter STAID (station identification number).
- **DATA FOR CONTINUING PAGES:1** When the number of parameters selected for tabling requires more than one page per sample, the user can specify what identifier will be used on the continuation pages. The seven available options are shown below:

Selection	Description
1	Date (default)
2	Station number
3	Station name
4	Local well number
5	Latitude and longitude
6	Station number and date
7	Local well number and date

Available selections for identifying samples on continuation pages in multiple-station format tables

Once the table definition has been constructed for table type 3, processing passes to the next step-- [storing the table definition](#).

When table type 4 is selected, four changes are made to the [basic menu](#).

- **DELETE LINE** replaces **DELETE COLUMN** .
- **PRINT PARAMETER CODES (Y OR N):Y** The user does not have the option to make a selection.
- **FOLDING OPTIONS (0,1,2, OR 3)** The user does not have the option to make a selection.
- **TABLE TITLE:0** The user may select one of the four table title selections shown below: Selection **Z** allows the user to supply any title text up to 80 characters. When **Z** is selected, " **TITLE:**" is displayed, and the user can enter the desired text.

Table title selection	Title text
B	BENTHIC INVERTEBRATE ANALYSES
C	PHYTOPLANKTON ANALYSES
D	PERIPHYTON ANALYSES
Z	Enter the heading text (80 characters maximum)

Table titles that may be specified for biologic style tables

Once the table definition for table type 1, 2, 3, or 4 is completed, the user may make changes to the definition. To do so, the cursor is positioned on the first field after **TABLE TYPE** . The user may enter a **<cr>** in fields that do not need to be changed and may retype the entry for fields that do need to be changed. This loop is continued until the user is satisfied with the table definition and responds with a **No** or **N** when prompted to change the table definition. The table definition may be saved for reuse on another table retrieval.

3.4.3.3 Specify Parameter Codes for Tabling

Parameter codes for output may be input from a file of parameter codes in a specific format [Appendix G](#), or may be entered interactively. A maximum of 1,000 parameters may be included in a table. The number of parameters may be reduced slightly when required parameters are automatically included by the tabling software. *For single-station format only*, composites that span the end of a month are permitted and are printed with the proper dates.

Next the user is prompted to enter parameter codes for tabling:

Select one of the following options to identify the columns in the table
(parameter codes are used to identify columns):

- 1 -- Enter parameter codes at the terminal
- 2 -- Enter a filename that contains a list of parameter codes

Enter option desired (1-2, or Q to quit):

If parameter codes are entered from the terminal, the following prompt appears:

Enter up to 1000 parameter codes:

(1) P: 00400

(2) P: _____

The next prompt is given the sequence number 2 and so forth until interactive entry is ended. Interactive parameter code entry is ended when a carriage return **<cr>** is entered for a parameter code. When interactive entry of parameter codes is completed, the user is given the opportunity to make changes to any entry by entering the sequence number of the parameter code to be changed. Parameter codes are checked against the parameter code dictionary so that invalid parameter codes are rejected upon entry. If parameter codes **81024 (drainage area)**, **72000 (datum)**, or **72008 (well depth)** are included in the list of parameters and are not present in the water-quality record, they will be retrieved from the sitefile record. All numeric parameters contained in the parameter code dictionary are supported. Alpha parameter codes also may be tabled. A complete list of alpha parameter codes is available in [Appendix A](#).

Below are characteristics to remember about parameters used in table publication format:

- Parameters are placed in the table in publication order unless the user chooses to place them in the order they are supplied. If only one parameter is selected to be included in the table, there is no option to place the parameters in publication order.
- When the alpha parameter CALCV (include all possible calculated parameters) is specified, all calculated parameters, in ascending numeric order, are inserted at the point where the CALCV parameter was listed.
- When the alpha parameter ADDPC is specified, all *numeric* parameters (including calculated parameters that have been stored) are printed in ascending numeric order.
- When the alpha parameter ALPHA is specified, the alpha codes are sorted alphabetically.
- A maximum of 1,000 parameters may be included in a single table (the number of parameters may be reduced slightly when required parameters are automatically included by the tabling software).
- If an invalid numeric parameter is requested, an error message is written and the requested parameter is ignored.
- Date printing may be suppressed for type 3 tables *only*. If the alpha parameter DATES is not in the parameter list, it is automatically inserted as the first parameter.
- The vertical folding option is limited to 5 parameters (including DATES). If more than five parameters are listed when the vertical folding option has been specified, the user receives an error message and a parameter count. Parameters must be reentered from the terminal, or reread from a file.
- Multiple occurrences of the same parameter are not permitted. If a parameter is entered more than once, the first occurrence is retained and others are deleted from the list.
- Parameters other than *biological (taxonomic)* parameters, and medium codes other than **L**, **M**, **N**, **O**, and **P**, will be substituted by the program for table type 4.

3.4.3.4 Water Quality Table Options

Eight options are available for formatting standard water-quality tables. These can be specified from the following menu:

```

qwtable -- current selections for options

(1) Limit Results by DQI Code:      X_Historical, Accepted, or presumed OK
    __ User Specified

(2) Parameter Order:                X_Publication Order __As Supplied

(3) Rounding of Result Values:      X_Default __User __None

(4) Censoring of Zero Values:       X_None __User Specified

(5) Recensoring of Values:          X_None __User Specified

(6) Qualifiers in Output:           __Yes X_No

(7) Footnotes:                      __None X_Remarks __Qualifiers

(8) Create Parmames File:           __Yes X_No

(9) Time Datum:                     X_Watch Time __User Specified

Enter item(s) to change (1-7) or <CR> to continue:

```

Screen with default specifications for specifying how parameter results will be printed in a table

The default specifications are marked with an **X** as on shown on the above screen. The default specifications can be accepted by entering a **<cr>**. Each option can be changed by entering numbers 1 through 7, to access one of the submenus described below:

1. Limit Results by DQI Code:

This allows the user to specify samples that will be tabled according to the data quality indicator (**DQI**) associated with each sample. By default, only samples that are marked as approved, accepted, or presumed satisfactory will be tabled. By selecting this option, the user may choose to include data that are in review, are not approved (rejected), or are proprietary. Data that are marked proprietary may not be published or made available to the public. If rejected results (DQI = Q or X) are included in water-quality table output, a '#' symbol will be included with the value to indicate that the result has been rejected.

NOTE: If calculated values are included in the output, the DQI associated with the calculated value will be determined by the DQI's of the parameters used in the calculation [Appendix D](#). The DQI for the calculated value will be applied from left to right in the following list:

X P O Q I S A R

For example, if the parameters used in the calculated value had DQIs of P, S, and R, the calculated value would have a DQI of P applied at output.

NOTE: If results have DQI codes that indicate they are proprietary (P, O, X) or that they are awaiting review or from unapproved methods (I), the results may not be available for retrieval by all users. Only users with certain access will be able to retrieve results with these DQI code

```

qwtable -- select result inclusion by DQI

The following categories are available:
A -- Historical
S -- Presumed satisfactory
R -- Reviewed and accepted
Q -- Reviewed and rejected
I -- Method in review
P -- Proprietary, unreviewed
O -- Proprietary and approved
X -- Proprietary and rejected

Enter 'all' or letters for categories desired, no space between:
    
```

2. Parameter Order

Allows the user to specify if data will be tabled in approved USGS publication order or in the order specified by the user on input.

```

qwtable -- select constituent ordering

Do you want numeric parameters in "publication" order (Y/N, <CR>=Y)?
    
```

NOTE: If alpha parameter codes are included in the list of parameters to be included in the output and publication ordering is selected, the parameters will not be included in publication order. To include alpha parameter codes with publication ordering, include the alpha parameter codes at the beginning of the parameter list.

3. Rounding of Result Values

```
qwtable -- select rounding
```

You have 3 options for rounding of parameter values--

D --PCD, from parameter code dictionary

U --User, use rounding stored with parameter

N -- None, output analysis value as stored

Enter option desired (<CR>=D):

Default rounding (D) produces tables with each parameter value rounded using the rounding instructions array in the Parameter-Method Table. A discussion of the rounding is included in the [Getting Started Section](#) and in the [Support Files \(section 3.6.7\)](#). The precision of results is based on an analysis of the variability of replicate measurements. Lacking such an analysis, users should select the “Default” rounding when preparing tables of water-quality data for publication. The “Default” rounding is based on laboratory analysis of the most precise method currently available, and uses precision data stored in the parameter-method table.

User-defined rounding (U) produces tables with each parameter value rounded using the rounding instruction stored with the analysis at the result level. If this option is selected, and the rounding code is not stored with a sample, the software will use the rounding code stored in the parameter-method table.

No rounding (N) produces tables in which each parameter is written as stored in the database.

4. Censoring of Zero Values:

Selecting to censor zero values makes available three other options. **Option 1** is the default -- zero values are not censored. **Option 2** allows the user to censor stored zero-value measurements based on a reference list [Appendix I](#); zero values will be converted to a null value and the remark code will be changed to **U** (material was analyzed for, but not detected.) for parameters in this list. **Option 3** allows the user to enter parameter codes and values interactively so that each parameter code and value pair can be set individually. **Option 4** allows the user to enter a file that contains individual parameter code and value pairs. The file must be in fixed-column format shown in [Appendix G](#).

qwtable -- set up user censoring of stored zero values

You have 4 options:

- 1 – no censoring of zero values**
- 2 -- censor by reference list only**
- 3 -- specify parameter code & value for selected parameters
at the terminal**
- 4 -- load a set of parameter codes with value from a file**

Enter option desired (1-4, <CR>=1):

5. Recensoring of values:

By selecting option 5, six options are available for censoring data at a new censoring level (recensoring). Recensoring does not change anything stored in the database. In output tables, however, any stored values less than the recensoring value is displayed as the recensored value and qualified with a '<' (less than) remark code. Recensoring may be useful to focus the data user's attention on the higher data values and away from visual differences that are not relevant to understanding environmental processes.

qwtable -- set up user re-censoring

You have 6 options for recensoring of constituents:

- 1 – No recensoring**
- 2 – Recensor all constituents to a specified value**
- 3 – Recensor each constituent to the highest lab reporting level stored
for the constituent-method**
- 4 – Recensor values for specified parameters and methods**
- 5 – Recensor each value that is below associated lab reporting level**
- 6 -- Recensor each constituent to the highest censored level**

Enter recensor option desired (1-6, <CR>=1):

Option 1, the default selection, includes results in output the way they are stored in the database. Results in the database are censored by the laboratory at a specified reporting level. This reporting level varies depending on the

constituent and the analytical method. In addition, the reporting level can change over time, due to conditions under which the sample is analyzed, or because of the chemical characteristics of the sample.

Option 2 allows the user to recensor all constituents in the data output to user-specified value. The output will display all results that are below the selected recensoring level as less-than the recensored value chosen. This option would most likely be used for comparisons among constituents, methods, and (or) laboratories. NOTE: If option 2 is selected and *fixed-value codes* are included in the parameter list, the value associated with the fixed value could be recensored if the recensoring value is greater than the stored value.

In the example below, the user has chosen a recensoring level = 10. The values in bold have been recensored for output.

<u>Parameter code</u>	<u>Stored value</u>	<u>Output</u>
01020	2	<10
01046	3	<10
00915	10	10
00930	15	15
00940	22	22

In the example below, the user has chosen a recensoring level = 0.1. The values in bold have been recensored for output.

<u>Parameter code</u>	<u>Stored value</u>	<u>Output</u>
46342	<0.05	<0.1
77825	<0.1	<0.1
46342	<0.08	<0.1

Option 3 allows the user to recensor all constituents to the highest stored associated reporting level for each unique constituent-method combination. If none of the measurements for a constituent-method combination are associated with a stored reporting level (e.g., data stored prior to NWIS 4_1 or transmitted by a laboratory with no reporting level), then no recensoring is performed on those results.

In the example below, parameter code 01046(B), 46342(A), 77825(C), and 46342(D) have stored reporting levels; the highest for each constituent-

method combination is used to censor results in the output. The values in bold have been recensored for output.

<u>Parameter code</u>	<u>Method Code</u>	<u>Reporting level</u>	<u>Stored value</u>	<u>Output</u>
01046	B	5	2	<5
01046	B	4	3	<5
01046	A		3	3
01046	A		10	10
01046			15	15
01046	B		22	22
46342	A	0.05	<0.05	<0.05
46342	A	0.05	E0.06	E0.06
46342	A	0.05	0.19	0.19
77825	C	0.1	<0.1	<0.1
77825	C	0.1	V0.15	V0.15
77825	C	0.1	0.2	0.2
46342	D	0.06	<0.08	<0.08
46342	D	0.06	E0.05	<0.06
46342	D	0.06	0.21	0.21

Option 4 allows the user to specify a new censoring level for each constituent-method combination. This may be done interactively by entering parameter code, method code, and recensoring value at the terminal or an input file may be used. The input file must use the fixed-column format shown in [Appendix G](#). This technique would most likely be used for spatial or trend analysis without regarding effects from compound interferences or changes in laboratory performance. This option provides the user with the maximum amount of control over recensoring. Constituents not specifically identified in the user-specified recensoring limits will not be recensored.

In the example below, the user has entered the following measurement-specific recensoring levels: 01046(A) = 5; 46342(A) = none; 77825(C) = 0.2; 46342(D) = 0.15. The values in bold have been recensored for output.

<u>Parameter code</u>	<u>Method Code</u>	<u>Stored value</u>	<u>Output</u>
01046	B	2	2
01046	B	3	3
01046	A	3	<5
01046	A	10	10
01046		15	15
01046	B	22	22
46342	A	<0.05	<0.05
46342	A	E0.06	E0.06
46342	A	0.19	0.19
77825	C	<0.1	<0.2
77825	C	V0.15	V0.2
77825	C	0.2	0.2
46342	D	<0.08	<0.15
46342	D	E0.05	<0.15
46342	D	0.21	0.21

Option 5 allows the user to censor each result that is below the associated reporting level for that result. The most common application of this option is to remove the results coded with an ‘E’-remark code that identify results below the reporting level. This technique would be used to reduce the probability of false positive detections in the data reporting. If no reporting level is stored with the result, then no recensorng is performed on the value.

In the example below, reporting levels for 01046(B) and 46342(D) affect the output of result values.

<u>Parameter code</u>	<u>Method Code</u>	<u>Reporting level</u>	<u>Stored value</u>	<u>Output</u>
01046	B	5	2	<5
01046	B	4	3	<4
01046	A		3	3
01046	A		10	10
01046			15	15
01046	B		22	22
46342	A	0.05	<0.05	<0.05
46342	A	0.05	E0.06	E0.06
46342	A	0.05	0.19	0.19
77825	C	0.1	<0.1	<0.1
77825	C	0.1	V0.15	V0.15
77825	C	0.1	0.2	0.2
46342	D	0.06	<0.08	<0.08
46342	D	0.06	E0.05	<0.06
46342	D	0.06	0.21	0.21

Option 6 allows the user to recensor using the highest censored value for each constituent in the data retrieved. The associated method code is not considered.

<u>Parameter code</u>	<u>Method Code</u>	<u>Stored value</u>	<u>Output</u>
34653		<0.021	< 0.03
34653		E0.003	< 0.03
34653	A	E0.021	< 0.03
34653	A	0.4	0.4
34653		<0.03	<0.03
34653	B	0.05	0.05
46342	A	<0.05	< 0.08
46342	A	E0.06	< 0.08
46342	A	0.19	0.19
77825	C	<0.1	<0.1
77825	C	V0.15	V0.15
77825	C	0.2	0.2
46342	D	<0.08	<0.08
46342	D	E0.05	< 0.08
46342	D	0.21	0.21

6. Qualifiers in Output:

qwtable -- select value qualifier inclusion

Do you want to include value qualifiers (Y/N, <CR>=Y)?

Value qualifiers are codes used to provide additional information about the value reported by the laboratory. The user may select to add or remove footnotes for remark codes and value qualifier codes with this option. The default for this option does not include value qualifiers in the table; however, they may be included if specified by the user here.

7. Footnotes:

Qwtable – select footnote inclusion

Do you want to create footnotes for remark codes (Y/N, <CR>=Y)?

Do you want to create footnotes for value qualifiers (Y/N, <CR>=Y)?

The default option will include only footnotes that define any remark codes that appear in the table.

8. Create a Parnames File:

qwtable – select parnames file creation

Do you want to create a parnames file (Y/N, <CR>=Y)?

A parnames files contains a listing of the parameter names included in the output for the current retrieval. The name of the file will be the output file name *parnames*. This file can be used as input for parameter names for another retrieval.

9. Time Datum:

```
qwtable -- select output time datum
Such as:
GMT   AST   EST   CST   MST   PST   AKST
HST
BST   ADT   EDT   CDT   MDT   PDT   AKDT
HDT

Enter the acronym of the time-datum desired
(<CR>=watch time):
```

This option allows for times in the output file to appear in any time datum chosen. The default option is to display the times using the [watch time \(section 2.1.9\)](#), which is equivalent to the time datum entered during login of the sample.

NOTE: Time datum will appear in output for a sample if the time-datum reliability code is 'K'; otherwise it will be blank in output unless the alphabetic parameter for time datum is specifically requested in the list of parameters.

3.4.3.5 Table Processing

Once the user is satisfied with the selections for tabling, a **<cr>** is entered and the table is processed. A list of the requested parameter codes, the total number of parameter codes, the database being accessed, and the number of records retrieved are displayed.

```

Checking (037) 01090 ...
Checking (038) 38260 ...
Checking (039) 80154 ...
Checking (040) 00063 ...
Checking (041) 50280 ...
Checking (042) 72104 ...
Checking (043) 72105 ...
Checking (044) 71999 ...
Checking (045) 84164 ...
Checking (046) 82398 ...

    46 parameters loaded.

Output specifications complete, retrieving data ...
Retrieving from database 01 ...
    17 records retrieved

Processing complete

Output is in the file: output

Do you wish to run again (Y/N, <CR>=N)?

```

Table processing display screen

When processing has completed, the output file name is displayed and the user may repeat the steps described above for developing a [Water-Quality Table by Sample](#) table or return to the [Option 4 -- Data Output](#) menu.

3.4.4 Option 4 -- Water Quality Table by Result

This option produces a table of result-level data from the Water-Quality File in columnar format. Each water-quality parameter for a particular sample is listed on a separate row with result-level codes listed in columns across the row. [Appendix C](#) has an example of this output.

Upon invoking this option, the user is prompted to enter the name of the file containing record numbers and the name of an output file to which the table will be written. After these filenames have been entered, the table definition is entered. These queries are described in detail in [Section 3.4.3.1](#) and [Section 3.4.3.2](#). **Note: This option cannot be used to make a type 4 – Biological table.**

3.4.4.1 Specifying the Result-Level Parameter Codes

The user next must enter alpha (sample and result-level) parameter codes. These will comprise the table columns. These codes may be entered interactively from the terminal or from an existing file that contains parameter codes in fixed-column format. All valid sample and result-level alpha codes ([Appendix A](#)) and the code ALPHA, which brings in all alpha codes, are acceptable for entry. If ALPHA is not entered, the alpha code PCODE must be entered so that parameter codes are printed. If the parameter code REMRK is not included in the parameter code list, remark codes will not be included in the output when the parameter code VALUE is included in the list. If the parameter code PLNAM is included in the list for output, the field will be restricted to 54 characters in the table.

Select one of the following options to identify the columns in the table (alpha codes are used to identify columns):

- 1 -- Enter alpha codes at the terminal
- 2 -- Enter a filename that contains a list of alpha codes

Enter option desired (1-2, or Q to quit):

Enter alpha parameter codes (include "PCODE" for parameter numbers):

- (1) P: PCODE
- (2) P: VALUE
- (3) P: DQIND
- (4) P: _____

Once the parameter codes have been entered, they are checked against the parameter code dictionary to make sure that they are valid codes. During interactive input, parameter codes are checked before the next entry and invalid entries must be reentered.

3.4.4.2 Specify Table Options

After the record numbers, output file name, and result-level parameter codes have been designated, a tabling specification screen comes up:

```

qwtable -- current selections for options

(1) Limit Results by DQI Code:      X_Historical, Accepted, or presumed
OK                                  __ User Specified

(2) Rounding of Result Values:      X_Default __User __None

(3) Censoring of Zero Values:       X_None __User Specified

(4) Recensoring of Values:          X_None __User Specified

(5) Qualifiers in Output:           __Yes X_No

(6) Footnotes:                      __None X_Remarks __Qualifiers

(7) Identify Rows in Table:         X_All __User Specified

(8) Create Parnames File:           __Yes X_No

(9) Time Datum:                    X_Watch Time __User Specified

Enter item(s) to change (1-7) or <CR> to continue:

```

Table options available with default settings for a result-level table

Options 1 through 6 and 8 through 9 are identical to those described in [Section 3.4.3.4](#). Option 7 invokes the following submenu, which allows the user to limit the by-result output. **Option 1**, the default, results in all parameters to be included in the output. **Option 2** allows the user to enter a list of the parameters from the terminal to be included in the output. **Option 3** allows the user to enter a file name that contains the parameter codes to be included.

```

qwtable -- set up to identify the rows in the table

Select one of the following options to identify the rows in
the table (numeric parameters are used to identify rows):

    1 -- accept all parameters available in a sample
    2 -- Enter parameter codes at the terminal
    3 -- Enter a filename that contains a list of parameter codes

Enter option desired (1-3,<CR>=1):

```

3.4.4.3 Table Processing

Once the user is satisfied with the selections for tabling, a **<cr>** is entered and the table is processed. A list of the requested alpha parameter codes, the database number accessed, and the number of records retrieved is displayed to the screen. If numeric parameter codes were specified in the output options, they are not displayed.

```

Loading selected parameters...
Checking (001) PCODE ...
Checking (002) VALUE ...
Checking (003) REMRK ...
Checking (004) ADATE ...
Checking (005) DQIND ...
Checking (006) DSTAT ...
Checking (007) LABNO ...
Checking (008) METHD ...
Checking (009) NULLQ ...
Checking (010) PDATE ...
Checking (011) PRPNO ...
Checking (012) QACOD ...
Checking (013) QUAL1 ...
Checking (014) QUAL2 ...
Checking (015) QUAL3 ...
Checking (016) RCMFL ...
Checking (017) RCMLB ...
Checking (018) RNDCD ...
Checking (019) RLTYF ...
Checking (020) RPLEV ...
      20 Parameters loaded
Output specifications complete, retrieving data...
Retrieving from database 01 ...
      1 records retrieved
Processing complete
Output is in the file: table

```

Table processing display screen

When processing has completed, the output file name is displayed and the user may repeat the steps described above for developing a [Water-Quality Table by Result \(section 3.4.4\)](#) table or return to the [Option 4 -- Data Output \(section 3.4\)](#) menu.

3.4.5 Option 5 -- Flat File by Sample

If this option is selected, the user can output data to an ASCII file (flat file) that may be used to enter data to another application, such as a statistics or graphics application. This option is similar to the **Water-Quality Tables by Sample (Publication Format)** option (see [Section 3.4.3](#)) except that output is in ASCII file format rather than in table format. Examples of this type of output are in [Appendix C](#).

3.4.5.1 Selecting the Output Format

There are six format options: fixed-column flat files with and without method codes, tab-delimited RDB files with and without method codes, or flat files with user-specified delimiters with and without method codes:

qwtable -- Flat file (by sample)

You have 6 options for flatfile output:

- 1 -- Fixed column flat file (qwflatout)**
- 2 -- Flat file with TAB delimiter (RDB format)**
- 3 -- Flat file with user-specified delimiter**
- (Following options include method code in output)**
- 4 -- Fixed column flat file (qwflatoutm)**
- 5 -- Flat file with TAB delimiter (RDB format)**
- 6 -- Flat file with user-specified delimiter**

Enter option desired (1-6, <CR>=1):

If a fixed-column format is selected (option 1 or 4), data are output to equally-spaced columns ([Appendix C](#)). If a fixed-column format is chosen with method code included, the method code is included adjacent to the remark code. For example, “<B 10.” indicates a less-than 10 value using method “B.” If delimited files are selected (options 2, 3, 5, or 6), the user is asked if the value and associated remark codes should be delimited. *[NOTE: If the user selects No, the remark code will appear as the first column in the value field (for example <0.05). For most applications, this will cause the value to be read as a character rather than as a number.]* If user-specified delimiter is selected (options 3 and 6), the user is prompted to enter the character that will be used to delimit the data. If no delimiter is entered, the default delimiter is a space.

qwtable --Flat file (by sample)

You have 6 options for flatfile output:

- 1 -- Fixed column flat file (qwflatout)**
- 2 -- Flat file with TAB delimiter (RDB format)**
- 3 -- Flat file with user-specified delimiter**
- (Following options include method code in output)**
- 4 -- Fixed column flat file (qwflatoutm)**
- 5 -- Flat file with TAB delimiter (RDB format)**
- 6 -- Flat file with user-specified delimiter**

Enter option desired (1-6, <CR>=1): 6

Enter column separator char or TAB for tab char:

Do you want remarks and values to be delimited (Y/N, <CR>=Y)? Y

3.4.5.2 Specifying the Retrieval Criteria

Once the desired output format has been selected, the user is prompted for the pathname of the file containing the record numbers, for a filename for the output file, and for parameter codes. Parameter codes may be entered interactively or from a fixed-column file. These queries are described in detail in [Section 3.4.3.1](#) through [Section 3.4.3.3](#).

3.4.5.3 Specify Output Options

When the parameter codes have been entered, a screen for selecting output specifications is displayed:

qwtable – current selections for options	
(1) Results Included in Table:	X_Historical, Accepted, or presumed OK __User Specified
(2) Parameter Order:	X_Publication Order __As Supplied
(3) Rounding of Result Values:	X_PCD __User __None
(4) Censoring of Zero Values:	X_None __User Specified
(5) Recensoring of Values:	X_None __User Specified
Enter item(s) to change (1-5) or <CR> to continue:	

These output options are the same as those for tabling data by sample and are described in detail in [Section 3.4.3.4](#).

3.4.5.4 Output Processing

When specifications are complete, processing begins. The screen displays the parameter codes being retrieved, the number of parameter codes loaded, the database number being accessed, and the number of records retrieved. When processing has completed, the output filename is displayed and the user may repeat the steps described above for developing a [Flat File by Sample](#) or return to the [Option 4 -- Data Output](#) menu.

3.4.6 Option 6 -- Flat File by Result

If this option is selected, the user is able to output data to an ASCII file (flat file) in a columnar format that uses one row (line) for each parameter. This format may be used to enter data to another application. This option is similar to [Option 4 -- Water Quality Table by Result \(see Section 3.4.4\)](#) except that output is in ASCII format rather than in table format.

3.4.6.1 Selecting the Output Format

Three formats are available for output to an ASCII file. Output may be written in fixed-column format, tab-delimited format, or with a user-specified delimiter. The user first selects the desired output format:

qwtable -- Flat file (by result)

You have 3 options for flatfile output:

- 1 -- Fixed column flat file**
- 2 -- Flat file with TAB delimiter (RDB format)**
- 3 -- Flat file with user-specified delimiter**

Enter option desired (1-3, <CR>=1):

If a fixed-column format is selected, data are output to equally-spaced columns ([Appendix C](#)). If a user-specified delimiter is selected (option 3), the user is prompted to enter the character that will be used to delimit the data. If no delimiter is entered, the default delimiter is a space.

3.4.6.2 Specifying the Retrieval Criteria

Once the desired output format has been selected, the user is prompted for the pathname of the file containing the record numbers and for a filename of the output file. These queries are described in detail in [Section 3.4.3.1](#). Next the user is queried for alpha (result-level) parameter codes. Parameter codes may be entered interactively or from a file. These queries are described in detail in [Section 3.4.4.2](#).

3.4.6.3 Specify Output Options

When the result-level alpha parameter codes have been entered, a screen for selecting output specifications is displayed. These five output specifications are identical to options 1, 2, 3, 4, and 7 for tabling result-level data and are described in detail in [Section 3.4.4.3](#). **Note: Options 5 and 6, in the corresponding menu in the tabling options, pertain only to tabling and are not included on this menu.**

When processing has completed, the output filename is displayed and the user may repeat the steps described above for developing a [Flat File by Result – Section 3.4.6](#) or return to the [Option 4 -- Data Output \(section 3.4\)](#) menu.

3.4.7 Option 7 -- Make a P-STAT Data Set

When this option is chosen, selected data from specified records may be written to a sequential file that may be read by the standard P-STAT input routines. When this option is chosen, ‘no rounding’ should be selected. If ‘no rounding’ is not selected the data output file will contain blanks and the P-STAT software will not be able to read the file. Examples of this type of output are available in [Appendix C](#).

3.4.7.1 Specifying the Retrieval and Output Criteria

The user is first queried for the pathname of a file containing record numbers and the pathname of an output file. These queries are the same as those for the other options in Data Output options and are described in detail in [Section 3.4.3.1](#).

When these files have been specified, the user is prompted to enter an output format option. Three options are available for handling values that include remark codes:

qtable -- P-stat format

p-stat output format

You have 3 options for handling remarks codes

- 1 -- Remarks (<, ND, etc.) included with the data**
- 2 -- Remarks deleted but values retained (a remark code of “ND” or “M” will yield a value of “-“, a missing value of the first kind**
- 3 -- Values with remarks codes set to “--“, a missing value of the second kind**

A count of the remarked values will be provided

Enter your choice (1-3):

1. **Option 1** - Remark codes may be included with the associated values in the output file. *Note : This format is invalid for input to P-STAT because P-STAT cannot handle remarks in this manner; it is provided for data verification only.*
2. **Option 2** - Remark codes may be suppressed and only the associated values included in the output file. For a remark code of ND (not detected)

there is no associated value; the output file will contain "-" (defined in P-STAT as a missing value of the first kind).

3. **Option 3** - All values associated with remark codes may be replaced with "--" (defined in P-STAT as a missing value of the second kind).

Regardless of which option is chosen, a summary list of remarked values is produced in a separate output file.

Next the user is queried for a list of parameter codes either entered interactively or from a file that contains a list of parameters ([Appendix G](#)). If the parameter list is not in a file, each parameter is entered from the terminal; a null entry (carriage return) ends the list. Only numeric parameters and the three *alpha parameters* ([Appendix A](#)) ADDPC, CALCV and SAMPL are valid. A maximum of 1,000 parameters may be included. These queries are described in detail in [Section 3.4.3.3](#).

3.4.7.2 Specify Output Options

When the parameter codes have been entered, a screen for specifying output options is displayed.

qwtable – current selections for options	
(1) Results Included in Table:	<input checked="" type="checkbox"/> Historical, Accepted, or presumed OK <input type="checkbox"/> User Specified
(2) Parameter Order:	<input checked="" type="checkbox"/> Publication Order <input type="checkbox"/> As Supplied
(3) Rounding of Result Values:	<input checked="" type="checkbox"/> PCD <input type="checkbox"/> User <input type="checkbox"/> None
(4) Censoring of Zero Values:	<input checked="" type="checkbox"/> None <input type="checkbox"/> User Specified
(5) Recensoring of Values:	<input checked="" type="checkbox"/> None <input type="checkbox"/> User Specified
Enter item(s) to change (1-5) or <CR> to continue:	

These output options are the same as those for tabling data by sample and are described in detail in [Section 3.4.3.4](#).

3.4.7.3 Output Processing

When specifications are complete, processing begins. The screen displays the parameter codes being retrieved, the number of parameter codes loaded, the database number being accessed, and the number of records retrieved.

```
Checking (038) 38260 ...
Checking (039) 80154 ...
Checking (040) 00063 ...
Checking (041) 50280 ...
Checking (042) 72104 ...
Checking (043) 72105 ...
Checking (044) 71999 ...
Checking (045) 84164 ...
Checking (046) 82398 ...
```

46 parameters loaded.

```
Output specifications complete, retrieving data ...
Retrieving from database 01 ...
    17 records retrieved
```

```
Processing complete
Your summary of parameters with remarks is in output.stats
```

```
Output is in the file: output
```

```
Do you wish to run again (Y/N, <CR>=N)?
```

Three output files should be created. The first file contains data retrieved for each record number requested and is given the name specified by the user. There are at least two 80-character lines per record. The first line for each record contains the station number, begin date, begin time, end date, and end time. If date or time are missing, as they may be for some historic samples, they are represented by "-" (defined by P-STAT as a missing value of the first kind). The remaining lines for each analysis each contain a maximum of eight data values. Each value occupies nine spaces and is preceded by a blank. If there is no value for a requested parameter, the value is represented by "-" (defined by P-STAT as a missing value of the first kind). [See section 2.7.1](#) for information on rounding.

A second output file is named by adding **".CMND"** to the file name supplied by the user. This file contains the P-STAT commands that are needed to identify the variables and the commands to read the data into P-STAT.

The third output file is named by adding **".STATS"** to the user-supplied file name and contains a summary of all values that have remark codes. The list includes (for each parameter code) every unique combination of remark code and value found, and a count of occurrences of that combination.

When processing has completed, the name of the file containing the data is displayed and the user may repeat the steps described above for developing a P-STAT File ([see section 3.4.7](#)) or return to the Option 4 -- Data Output ([see section 3.4](#)) menu.