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BHI-00790
Rev. 0

PUMP-AND-TREAT DATABASE

User's Guide

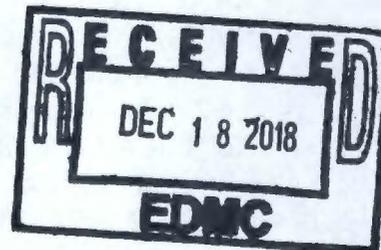
Author
R. T. Adams

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Bechtel Hanford, Inc.
Richland, Washington



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1.0 INTRODUCTION

Each pump-and-treat database is a Microsoft® Access™ database system that contains information regarding daily operations, daily process analytical data, and performance monitoring analytical data. The purpose of this Pump-and-Treat Database User's Guide is to describe how to access and use the pump-and-treat databases. This User's Guide is based on the 100-HR-3 pump-and-treat database, which is the prototype for the pump-and-treat database design.

2.0 HOW TO USE THIS GUIDE

2.1 PURPOSE

This user's guide is intended for a general audience who is familiar with the Hanford Site and assumes the user has a working knowledge of Microsoft® Windows® 3.1. Please consult the *Microsoft® Windows® User's Guide* if you are unfamiliar with Windows®. This user's guide will assist with the setup and use of the pump-and-treat database application.

2.2 USER'S GUIDE CONVENTIONS

This guide uses several typographic conventions to help distinguish between what is typed, what keys are pressed, and what information is displayed on the screen. The following conventions are used throughout this guide:

<i>Button Names</i>	Button names have been italicized, and the first letter of each word in the button name is capitalized.
<i>SCREEN NAMES</i>	Screen names are italicized and uppercase.
SCREEN SUBJECT	Screen subjects (e.g., text box names) are in regular type and have all letters in uppercase.
bold	Keys or text that must be typed at the keyboard or items that must be selected with the mouse are in bold text.
	This symbol highlights key information that needs to be understood.

To select and activate a menu option, highlight the option by

- using the **Tab** key and pressing **Enter**, or
- using the **Arrow** keys and pressing **Enter**, or
- pointing with the mouse and **clicking** the left mouse button.

3.0 INSTALLING THE PUMP-AND-TREAT DATABASE ON YOUR SYSTEM

3.1 SYSTEM REQUIREMENTS

In order to operate a pump-and-treat database, the following is required:

- a 386/20 IBM-compatible PC with 4 megabytes of RAM (a 486/66 IBM-compatible PC with 16 megabytes of RAM is recommended)
- 12 megabytes of free space on hard disk
- MS-DOS® version 5.0 or higher
- Microsoft® Windows®, Windows for Workgroups™, or Windows NT™ operating system version 3.1 or higher
- a mouse.

3.2 NETWORK REQUIREMENTS

Each pump-and-treat database can be accessed through the Bechtel Hanford, Inc. (BHI) dedicated file server.

3.3 OPENING A USER'S ACCOUNT

For access to a pump-and-treat database, contact the Data Management Point of Contact at 372-9673 for access authorization.

The Data Management Point of Contact will contact the BHI Help Desk to authorize access to the appropriate network server and the Database Administrator to grant a user's name and password.

The Database Administrator will contact requestors to inform them of their user names and passwords.

3.4 DATABASE SECURITY

Database security includes the following user groups:

- Admin Group -- Full access to perform database maintenance.

- Data Entry Group -- Insert, update, and delete privileges.
- Data Verification Group -- Read-only access with the ability to add data verification to the daily operations data.
- Reporting Group -- No data entry privileges. Ability to display, report, and export data to Microsoft Excel™.

3.5 INSTALLATION PROCEDURE

Once access to the requested pump-and-treat database has been authorized, complete the following steps:

- From the *PROGRAM MANAGER*, select the *Run* option from the *FILE* pull-down menu.
- Type `\\bhi001\XXXX\disk1\setup.exe` at the Command Line (*XXXX* represents the name of the specific pump-and-treat database, e.g., 100hr3).
- Click on the *OK* button.
- The *WELCOME* screen will appear, click on the *OK* button to start the installation or click on the *Exit Setup* button to exit the installation program.

The setup program will search for installed components and will prompt for a destination directory. At this time, you may type a new directory name or use the default directory name. To continue:

- Click on the *OK* button.
- Click on the *Computer* button.



The program will then prompt for the Program Group Name. Either type a new one, use the default, or choose one of the existing groups. To continue the installation, do the following:

- Click on the *Continue* button.

To abort the installation program, do the following:

- Click on the *Cancel* button.

- Then click on the *Exit Setup* button.

The system will check for necessary disk space and update the user's system. A message screen will inform you that the setup was completed successfully.

- Click on the *OK* button.

3.6 SOFTWARE APPLICATION UPGRADES

Like other software products, occasional software upgrades will need to be performed. Users will be contacted via cc:Mail when a new software version has been released and should follow the steps in Section 3.5, *Installation Procedure*, to install the new version on their workstations.

4.0 GETTING STARTED WITH THE PUMP-AND-TREAT DATABASE

4.1 CONNECTING AND DISCONNECTING

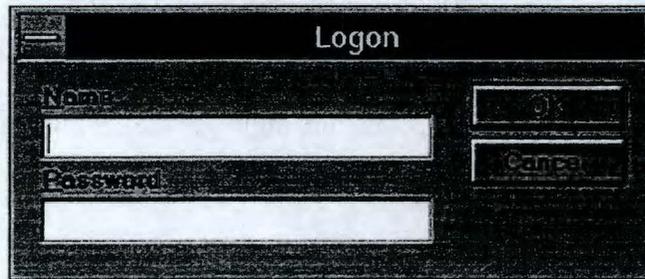
Before starting a pump-and-treat database, your computer must be able to access the necessary computer resources on the BHI file server (see Sections 3.3 and 3.4).

To start the program and connect, complete the following steps:

- **Start Windows® and log on.**
- **Double click on the pump-and-treat database icon.**



The login screen below will appear.



Type your name and password. The password is hidden with asterisks as it is typed in. Your user name is case sensitive.

- **Connect to the database by typing your User's Name and Password.**

The *OK* button gives the user access to the Pump-and-treat Main Menu. The *Cancel* button exits the application. If the User/Password combination is invalid, an error message appears and prompts for the **User Name** and **Password** again.

- **Click on the *OK* button or press *Enter*.**

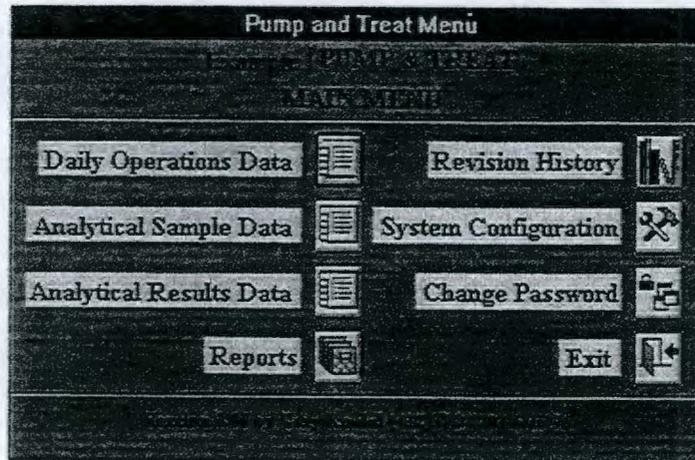
To disconnect from the pump-and-treat database:

- From the *MICROSOFT™ ACCESS™* window, select the *EXIT* option from the *FILE* pull-down menu

Always disconnect from the database when not in use.

5.0 USING THE PUMP-AND-TREAT DATABASE MAIN MENU

After successfully logging into the database, the main menu will appear.



To access a screen, select the appropriate button either by pressing the **Tab** key or by **clicking** with the left mouse button. To exit the application, highlight the *Exit* button option and press **Enter** or **click** the left button on the mouse.

5.1 DAILY OPERATIONAL DATA ENTRY/VIEWING SCREEN

There are nine forms within the DAILY OPERATIONAL DATA ENTRY/VIEWING SCREEN. You can display a specific form by selecting its associated view button (e.g., selecting the *Extraction Wells* button activates the extraction well data fields).

Well Name:	System Name:	Online?:	Flow (gpm):	Level (ft):	Totalizer (gal):
D5-14	System 4	<input checked="" type="radio"/> Yes	3.02	2.42	17965
D5-15	System 5	<input checked="" type="radio"/> Yes	15.62	3.3	90787
D5-16	System 6	<input type="radio"/> Yes	3.8	2.96	18702

In general, each of the forms shares the following function buttons:

	<i>Door</i>	Close form
	<i>Disc with Pencil</i>	Save current changes
	<i>Red X with Pencil</i>	Delete current changes
	<i>Pencil Eraser</i>	Undo previous action or changes
	<i>Double Windows</i>	Duplicate record and save as new record
	<i>Binoculars</i>	Find record for field in which cursor currently resides
	<i>Checkmark</i>	Verify record (if user has appropriate access).
	<i>Headers/Footers</i>	Information at the top and bottom of the screens, e.g., titles, buttons, notes, and disclaimers, will always remain on screen.

In addition, the forms share other features:

- Comments can be entered into the COMMENTS field. The field is displayed anytime by pressing the *PageDown* key.

Data Entry Features

- Enter data by selecting a field (e.g., text box) or control (e.g., radio button) using the **Tab** key or by **clicking** with the left mouse button and then typing.

- The ENTERED BY and DATE ENTERED fields are automatically filled when the user chooses to add a new record. The VERIFIED BY and DATE VERIFIED are filled in by pressing the *Checkmark* button located in the center of the screen footer.
- On the forms, the component names (e.g., extraction well name D5-14) are automatically added to the forms when a new record has been added. To complete data entry on the form, enter data in every row that has a component name already added. When you reach the blank bottom row, you have entered all of the data for this particular form. Pressing **Ctrl-Tab** keys will move the cursor to the next data field or control.
- Data records are saved by pressing the *Disk with Pencil* button. Records are also saved automatically when you move to another record in a form or when you close the form.
- Data records cannot be edited once verification is complete. Changes to verified records can only be performed by the Database Administration Group.
- All times entered into the *DAILY ROUTINES* screen are in Pacific Standard Time.

The forms are described in the following sections.

5.1.1 Extraction Wells Form

The EXTRACTION WELLS form is displayed by default in the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

Daily Routines Data Entry / Views

Entered By: Admin
Date Entered: 05/13/1996 13:03

Gauge:	Reading: (psig)
PI-4-5	
PI-4-1	
PI-4-2	
PI-4-3	

Well Name:	System Name:	Online?	Hours Online Flow: (gpm)	Level: (ft)	Totalizer: (gal)
D5-14	System 4	<input type="radio"/> Yes	#Name?		
D5-15	System 5	<input type="radio"/> Yes	#Name?		
D5-16	System 6	<input type="radio"/> Yes	#Name?		

Buttons: Extraction Wells, Tanks, Effluent System, Temperature Data, Reception Well, Units, Sample Points, Work Area, Supplier

Record: 1 of 27

Data fields on this forms include the following:

- LOGBOOK ID
- OPERATOR'S NAME
- DATE (when operational data were recorded)
- REALIGNMENT (radio button) to indicate system realignment
- WEEKEND (radio button) to indicate if data were recorded on the weekend
- ENTERED BY
- DATE ENTERED
- VERIFIED BY
- DATE VERIFIED
- WELL NAME
- SYSTEM NAME
- ONLINE (radio button)
- FLOW (gpm)
- LEVEL (ft)
- TOTALIZER (gal)
- CLORIMETER CHECK
 - DET. #1
 - DET. #2

The *EXTRACTION WELL* screen shows whether the extraction well was online, hours online, well water-level, flow rates in gallons per minute, pressure indicators, and totalizer reading.

5.1.2 Reinjection Wells Form

The *REINJECTION WELLS* form is displayed by selecting the *Reinjection Wells* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

Well Name	Online?	Hours Online	Flow (gpm)	Level (ft)	Totalizer (gal)
D5-18	<input checked="" type="radio"/> Yes	#Name?			
D5-19	<input checked="" type="radio"/> Yes	#Name?			

Data fields on this form include the following:

- PRESSURE DATA
- WELL NAME
- ONLINE (radio button)
- HOURS ONLINE
- FLOW (gpm)
- LEVEL (ft)
- TOTALIZER (gal).

The *REINJECTION WELLS* screen shows whether the reinjection well was online, well water-level, flow rates in gallons per minute, pressure indicators, and the totalizer reading.

5.1.3 Tank Form

Tank:	Level: (ft)	Time:	Temperature: (deg F)
TK-1A	2.81	9:35	
TK-1C	2.45	9:35	
TK-2A	4.62	9:35	
TK-2B	4.45	9:35	

The *TANKS* form is displayed by selecting the *Tanks* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

Data fields on this form include the following:

- TANK
- LEVEL
- TIME
- TEMPERATURE.

The *TANKS* form contains water levels in feet and temperature measurements in degrees Fahrenheit for Tanks #1 and #2.

5.1.4 Ion Exchange Units Form

The *ION EXCHANGE UNITS* form is displayed by selecting the *Ix Units* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

IX Column	Position	Set Flow (gpm)	Actual Flow (gpm) (Enter flow for 1st Column Onl)
T-100	sb	40	40.1
T-200	3		
T-300	1		
T-400	2		

Data fields on this form include the following:

- PRESSURE DATA
- IX COLUMN
- POSITION
- SET FLOW
- ACTUAL FLOW.

The *ION EXCHANGE UNITS* form contains positions of the columns, pressure data, and gallons per minute processed. Columns position can be set to 1, 2, 3, or SB (standby). The "3" position indicates the polishing column.

Ion-exchange column-position data can be entered manually into the text fields.

NOTE: Set flow and actual flow values should only be entered for column T-100. If flow values are not properly entered, the Daily Routines Report may not print out correctly.

5.1.5 Effluent System Form

The *EFFLUENT SYSTEM* form is displayed by selecting the *Effluent System* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

The screenshot shows a software interface window titled "Daily Routines Data Entry / Views". The window contains several data entry fields and tables. At the top, there are fields for "EFL-1144-2", "Steffen, Rosanne", and "01/02/1996 00:00". Below these are "Realignmet:" and "Weekend" sections. A "Gauge:" table lists four pressure indicators (PI-E-1 to PI-E-4) with a "Reading: (psig)" column, all showing "0". A table for "Effluent Filter" status includes columns for "Effluent Filter", "Booster Pump On?", and "Gravity Drain?". The "Effluent System" button is highlighted. The bottom of the window shows "Record: 1 of 27" and a set of navigation icons.

Realignmet:	Weekend	Gauge:	Reading: (psig)
GLkindel		PI-E-1	0
04/29/1996 13:15		PI-E-2	0
		PI-E-3	0
		PI-E-4	0

Effluent Filter	Booster Pump On?	Gravity Drain?
F-E-1A	<input type="radio"/> YES	<input checked="" type="radio"/> YES
F-E-1B	<input type="radio"/> YES	<input checked="" type="radio"/> YES
	<input type="radio"/> YES	<input type="radio"/> YES

Data fields on this form include the following:

- PRESSURE DATA
- EFFLUENT FILTER
- BOOSTER PUMP ON?
- GRAVITY DRAIN?

The *EFFLUENT SYSTEM* form contains pressure data, the status of the booster pump, whether the system is gravity draining, and pressure indicators on the effluent filters.

5.1.6 Sample Points Form

The *SAMPLE POINTS* form is displayed by selecting the *Sample Points* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

Sample Point	Time	Reading (in mg/l)	Dilution factor	Sample Number
V4-10				
V5-10				
V6-10				
V2-2				

Data fields on this form include the following:

- SAMPLE POINT
- TIME
- READING
- DILUTION FACTOR
- SAMPLE NUMBER.

The results of the field screening samples, dilution factor, and sample time are recorded on the *SAMPLE POINTS* form. The field screening results are recorded in milligrams per liter.

NOTE: The SAMPLE NUMBER field is a selectable list of valid HEIS sample numbers for samples collected from the system for analysis. This field cross-references field sampling locations with lab sampling locations.

5.1.7 Temperature Data Form

The *TEMPERATURE DATA* form is displayed by selecting the *Temperature Data* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

Temp Measure Pt.	Reading: (deg F)	Comment
TE-4		
TE-5		
TE-6		

Data fields on this form include the following:

- TEMP MEASURE PT
- READING
- COMMENT.

The *TEMPERATURE DATA* form contains temperature measurements in degrees Fahrenheit for the system.

5.1.8 Waste Area Inspection Form

The *WASTE AREA* form is displayed by selecting the *Waste Area* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

Waste Item:	Container Integrity Ok?	Volume:	Volume Disposed:
Spent Resin (55 gal drum)	<input type="radio"/>		
Misc Susp. Waste (55 gal drum)	<input type="radio"/>		

Data fields on this form include the following:

- WASTE ITEM
- CONTAINER INTEGRITY OK?
- VOLUME
- VOLUME DISPOSED!

The *WASTE AREA* form contains waste inspection data, i.e., waste container integrity, volume of waste generated (in 55-gallon [gal] drums), and volume of waste removed for disposal (in 55-gal drums).

5.1.9 Supplies Form

The *SUPPLIES* form is displayed by selecting the *Supplies* button on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen when opened.

The screenshot shows a software window titled "Daily Routines Data Entry / Views". The window contains several data entry fields and a table. The fields include:

- EFL-1144-2
- Steffen, Rosanne
- 01/02/1996 00:00
- Reassignment: Weekend
- GLkindel
- 04/29/1996 13:15

Below the fields is a table with the following columns: Supply Item, Amount, and Ordered. The table contains the following rows:

Supply Item	Amount	Ordered
Biocide (gallons)		
AccuVac Amp. (box)		
Cr Standards (ampules)		
New IX Resin (cu ft)		

At the bottom of the window, there are several navigation buttons and a status bar that reads "Record: 1 of 27".

Data fields on this form include the following:

- SUPPLY ITEM
- AMOUNT
- ORDERED.

The *SUPPLIES* form contains the inventory of supplies for the pump-and-treat system.

5.2 ANALYTICAL SAMPLE DATA SCREEN

The *ANALYTICAL SAMPLE DATA ENTRY/VIEWS* screen is accessed by selecting the *Analytical Sample Data* button on the *PUMP & TREAT MAIN MENU*.

Field Name	Value
Sample Number	B02837
Sample Date/Time	09/01/1994 12:00
Sample Location	VS-10
Media	
QC?	
QC Type	
Lab Name	
SAF	B94-009
Comments	
Composite Type	
Related Sample Type	
Related Sample Number	
Master Sample Flag	
Filtered?	
Sampler	TRAPP/BOWEES
Project Lead	THOMPSON,ST JOHN
Field Team Leader	
Field Log ID	
Field Log Page	

Data fields on this screen include the following:

- SAMPLE NUMBER
- SAMPLE DATE/TIME
- SAMPLE LOCATION
- MEDIA
- QC?
- QC TYPE
- LAB NAME
- SAF
- COMMENTS
- COMPOSITE TYPE
- RELATED SAMPLE TYPE
- RELATED SAMPLE NUMBER
- MASTER SAMPLE FLAG
- FILTERED?
- SAMPLER
- PROJECT LEAD
- FIELD TEAM LEADER
- FIELD LOG ID
- FIELD LOG PAGE

Sampling information includes the sample number, date and time of collection, the place where the sample was taken, the type of sample, and the Sample Authorization Form number. SAMPLE LOCATION and QC TYPE have pull lists from which to select information.

 Use the *Duplicate* button (two boxes) to copy the current record.

5.3 ANALYTICAL RESULTS DATA SCREEN

The *ANALYTICAL RESULTS DATA SCREEN* is accessed by selecting the *Analytical Results Data* button on the *PUMP & TREAT MAIN MENU*.

Constituent ID	Result	2 Sigma Counting Error	Total Error	MDA	Units	Analysis Method	Qualifier
040472	1.37				mg/L	EPA6010A	

Standard Value and Units: 1.37 mg/L

Entered By: [] Date/Time Entered: 5/25/96 10:25

Record: 1 of 236

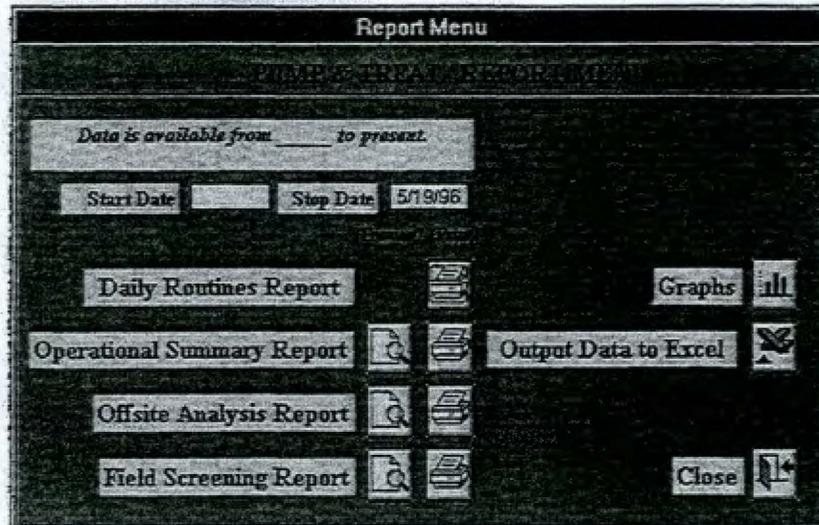
Data fields on this screen include the following:

- SAMPLE NUMBER
- SAMPLE SUFFIX
- SAMPLE MATRIX
- LAB CODE
- LAB RECEIVED DATE
- LAB SAMPLE ID
- FORM
- FORMAT
- SDG NUMBER
- CONSTITUENT ID
- 2 SIGMA COUNTING ERROR
- TOTAL ERROR
- MDA
- UNITS
- ANALYSIS METHOD
- QUALIFIERS
- STANDARD VALUE AND UNITS
- ENTERED BY
- DATE/TIME ENTERED.

This screen contains the analytical data results. CONSTITUENTS, UNITS, and SAMPLE SUFFIX have pull-down menus from which to make selections. To duplicate the record being viewed, select the *Duplicate* button (two boxes).

 To duplicate the record being viewed, select the *Duplicate* button (two boxes).

5.4 REPORT MENU SCREEN



There are four reports available with the system:

- Operational Summary Report

The Operational Summary Report includes the following:

- | | |
|---------------------------|-----------------------------------|
| - date | - influent chromium concentration |
| - extraction wells in use | - effluent chromium concentration |
| - injection wells in use | - chromium removed |
| - liters processed | - system realignment flag. |
| - total liters processed | |

Chromium concentrations are reported in milligrams per liter.

- Off-site Analytical Summary Report

The Off-site Analytical Summary Report includes the following:

- | | |
|--------------------------------------|---|
| - sample location | - HEIS sample number |
| - sample date | - off-site lab total chromium results |
| - off-site lab chromium (6+) results | - field screening chromium (6+) results |
| - comments field. | |

All results are in milligrams per liter.

- **Field Screening Summary Report**

The Field Screening Summary Report includes the following:

- the date
- concentrations in milligrams per liter for each sample location.
- all field screening sample locations

- **Daily Routine Report**

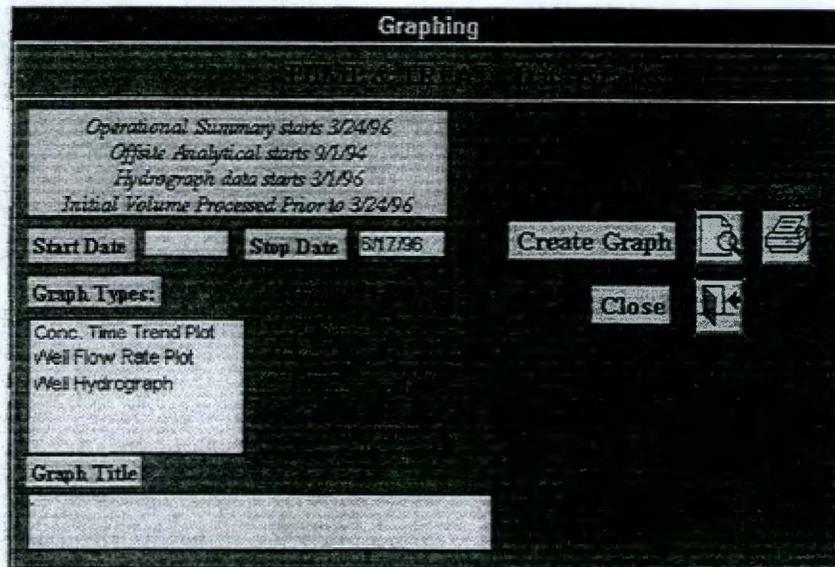
The Daily Routine Report includes all of the data used for data entry on the *DAILY ROUTINES DATA ENTRY/VIEWS* screen.

To generate a report, enter a **valid start date** and **stop date** in the appropriate fields, and press the appropriate *Preview* or *Print* button.

- ☞ A valid date range for a report or graph must have values for the date fields in a standard short date format (e.g., 3/3/96) and the **START DATE** must be an earlier date than the **STOP DATE** (e.g., **START DATE** = 10/23/96 and the **STOP DATE** = 10/24/96). Valid date ranges can start and stop on the same date (a date range of one day).

Examples of all reports are provided in Appendix A.

5.4.1 Graphing Menu Screen



There are four graph types available with the system:

- Well Hydrograph
Plots water-level elevation versus time
- Well Flow Rates Plot
Plots flow rates for all of the wells in the system versus time
- Ion Exchange System Flow Rates Plot
- Cr 6+ Concentration Time Trend Plot
Plots chromium concentrations for field screening sample locations versus time

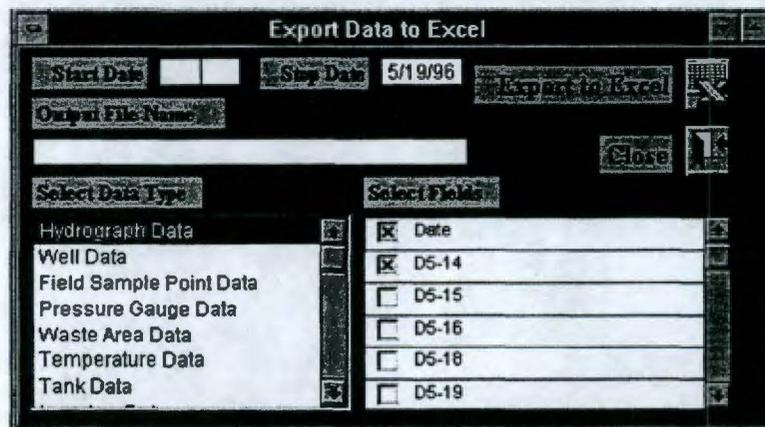
To generate a graph, enter a valid START DATE and STOP DATE, select from a list of wells or sample locations, and press the appropriate *Preview* or *Print* button.

- A valid date range for a report or graph must have values for the date fields in a standard short date format "3/3/96" and the START DATE must be an earlier date than the STOP DATE (i.e., START DATE = 10/23/96 and the STOP DATE = 10/24/96). Valid Date ranges can start and stop on the same date, having a date range of one day.

Examples of the graphs are provided in Appendix A.

5.4.2 Outputting Data to Excel

Data that may be exported to Microsoft Excel™ include hydrograph, well, field sample point, pressure gauge, waste area, temperature, tank, inventory, and ion exchange.



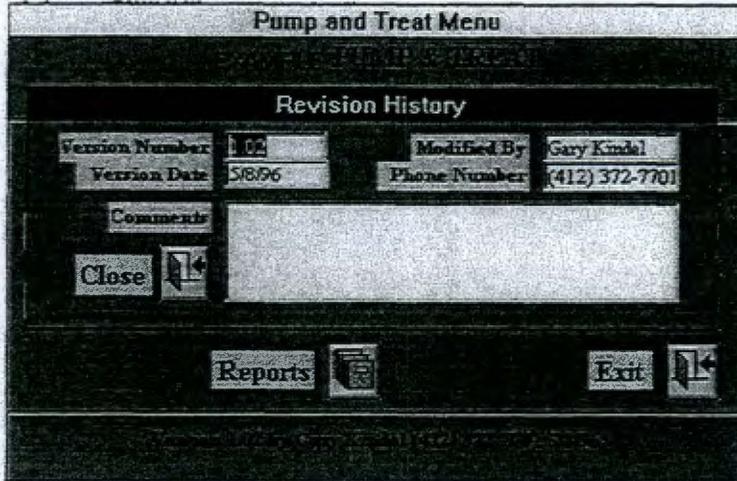
To export data to Microsoft Excel™, perform the following steps:

- (1) Enter valid dates for START DATE and STOP DATES.
- (2) Enter a complete valid file name, including the path statement and file extension (e.g., C:\EXCEL\MYDATA.XLS, where C:\EXCEL\ is the path statement and MYDATA.XLS is the file name with the Excel™ extension “.xls”).
- (3) Select the data type you want to export from the SELECT DATA TYPES list box. Highlighting the data type by **clicking** the left mouse button.
- (4) **Click** the left mouse on the check box beside the desired fields in the SELECT FIELDS list box.
- (5) After completing Steps 1 through 4, export the data by pressing the *Export to Excel* button to create a Microsoft Excel™ single spreadsheet file (version 3.0).

☛ A valid file name using the DOS naming convention is “8.3.” To assign a valid file name, use one to eight alpha-numeric characters followed by a period (“.”) and then up to three more alpha-numeric characters after the period.

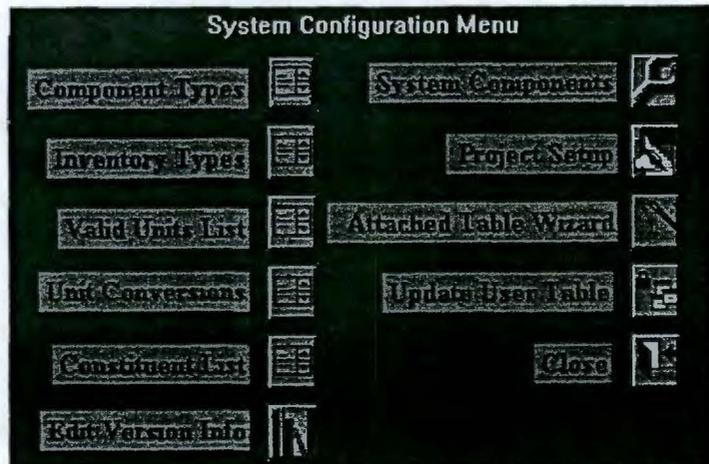
5.5 REVISION HISTORY SCREEN

The *REVISION HISTORY* screen displays the version number, version date, modified by, phone number, and comments field for the current version of the system. The comments field indicates what changes were made over the previous version. For more information, contact the Database Administrator at 372-9673.

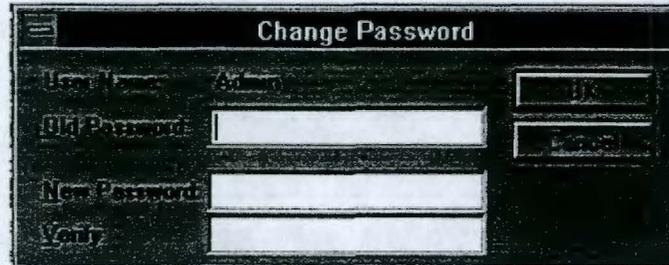


5.6 SYSTEM CONFIGURATION MENU

The system configuration for the pump-and-treat database is controlled through the *SYSTEM SETUP MENU*. This menu and tools are for system administration and development only.



5.7 CHANGING PASSWORD



The image shows a 'Change Password' dialog box. It has a title bar with the text 'Change Password' and a close button (X) on the left. Below the title bar, there are three input fields: 'Old Password', 'New Password', and 'Verify'. To the right of these input fields are two buttons: 'OK' and 'Cancel'.

To change your password, press the *Change Password* button. Enter your current password and your new password twice, then press the *OK* button. To cancel, press the *Cancel* button. If you have forgotten your current password, contact the Database Administrator at 372-9673 to reset your account password.

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APPENDIX

Examples of Pump-and-Treat Database Reports

Examples of pump-and-treat database reports include:

- Appendix A-1 Daily Routine Report
- Appendix A-2 Operational Summary Report
- Appendix A-3 Off-Site Analysis Report
- Appendix A-4 Field Screening Report
- Appendix A-5 Graphs
- Appendix A-6 Description of Qualifiers.

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APPENDIX A-1
Daily Routine Report

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APPENDIX A-2

Operational Summary Report

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100-HR-3 Pump and Treat Operational Summary (Page 1 of 3)

6/13/96 11:48:20 AM

(Specified From Monday, January 01, 1996 to Thursday, June 13, 1996)

Date	Calc. Data	Extraction Wells In Use			IX Columns In Use				Injection Wells In Use		Liters Processed	Total Liters Processed	Influent Cr (mg/L)	Effluent Cr (mg/L)	Cr(6+) Removed (g)	Realignment
		D5-14	D5-15	D5-16	T-100	T-200	T-300	T-400	D5-18	D5-19						
3/24/96	No	Yes	Yes	Yes	1	3	SB	SB	Yes	No	142,379	41,182,319	.88	0 U	125	No
3/27/96	No	Yes	Yes	Yes	1	3	SB	SB	Yes	No	182,117	41,364,437	.56	0 U	102	No
4/1/96	No	Yes	Yes	Yes	1	3	SB	SB	Yes	No	162,003	41,526,440	1	0 U	162	No
4/2/96	No	Yes	Yes	Yes	1	3	SB	SB	Yes	No	162,494	41,688,933	1	0 U	162	No
4/3/96	No	Yes	Yes	Yes	1	3	SB	SB	Yes	No	166,527	41,855,461	.92	0 U	153	No
4/4/96	No	Yes	Yes	Yes	1	3	SB	SB	Yes	No	181,136	42,036,596	1.12	0 U	203	No
4/5/96	No	Yes	Yes	Yes	1	3	SB	SB	Yes	No	85,362	42,121,959	1.12	0 U	96	No
4/6/96	Yes	Yes	No	No	SB	SB	SB	SB	Yes	No	38,320	42,160,279	NV	NV	0	No
4/7/96	Yes	Yes	No	No	SB	SB	SB	SB	Yes	No	38,320	42,198,599	NV	NV	0	No
4/8/96	No	Yes	No	Yes	1	3	SB	SB	Yes	No	69,500	42,268,099	1.28	0 U	89	No
4/9/96	No	Yes	No	Yes	1	3	SB	SB	Yes	No	69,827	42,337,926	1.36	0 U	95	No
4/10/96	No	Yes	No	Yes	1	3	SB	SB	Yes	No	68,573	42,406,500	1.24	0 U	85	No
4/11/96	No	No	No	No	1	3	SB	SB	Yes	No	0	42,406,500	0 U	0 U	0	No
4/12/96	No	Yes	No	Yes	1	3	SB	SB	Yes	No	84,654	42,491,153	1.36	0 U	115	No
4/13/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	84,654	42,575,807	NV	NV	0	No
4/14/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	65,412	42,641,219	NV	NV	0	No
4/15/96	No	Yes	No	Yes	1	3	SB	SB	Yes	No	65,412	42,706,630	.84	0 U	55	No
4/16/96	No	Yes	No	Yes	1	3	SB	SB	Yes	No	68,682	42,775,313	.84	0 U	58	No
4/17/96	No	Yes	No	Yes	1	3	SB	SB	Yes	No	66,447	42,841,760	1.04	.01 U	68	Yes
4/18/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	69,772	42,911,533	.64	0 U	45	No
4/21/96	Yes	No	No	No					No	No	0	42,911,533	NV	NV	0	No
4/22/96	No	No	No	No	SB	SB	SB	SB	No	No	0	42,911,533	NV	NV	0	No
4/23/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	87,216	42,998,748	.92	0 U	80	No

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Calc Data = Yes if data is estimated for weekend.
Daily data is not recorded over weekends.

SB = standby, 1 = lead, 2 = lag, 3 = polishing
U = Undetctd Value, S = Suspect Value

Influent = Tank 1 composite sample point
Effluent = Polishing column discharge sample point

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100-HR-3 Pump and Treat Operational Summary (Page 2 of 3)

6/13/96 11:48:25 AM

(Specified From Monday, January 01, 1996 to Thursday, June 13, 1996)

Date	Calc. Data	Extraction Wells In Use			IX Columns In Use				Injection Wells In Use		Liters Processed	Total Liters Processed	Influent Cr (mg/L)	Effluent Cr (mg/L)	Cr(6+) Removed (g)	Realignment
		D5-14	D5-15	D5-16	T-100	T-200	T-300	T-400	D5-18	D5-19						
4/24/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	78,712	43,077,460	1	0 U	79	No
4/25/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	77,077	43,154,537	1	0 U	77	No
4/26/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	75,769	43,230,306	.96	0 U	73	No
4/27/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	75,769	43,306,074	NV	NV	0	No
4/28/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	76,259	43,382,333	NV	NV	0	No
4/29/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	76,259	43,458,593	.96	0 U	73	No
4/30/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	76,150	43,534,743	.92	.01 U	69	No
5/1/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	75,987	43,610,729	.8	.02	59	No
5/2/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	75,223	43,685,953	.92	.02	68	No
5/3/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	75,223	43,761,176	1.24	.02	92	No
5/4/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	75,223	43,836,400	NV	NV	0	No
5/5/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	74,678	43,911,078	NV	NV	0	No
5/6/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	74,678	43,985,756	.92	.01 U	68	No
5/7/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	75,605	44,061,361	.84	.01 U	63	No
5/8/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	76,423	44,137,784	.92	.01 U	70	No
5/9/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	76,150	44,213,934	.92	.01 U	69	No
5/10/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	76,314	44,290,248	.92	0 U	70	No
5/11/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	75,932	44,366,180	NV	NV	0	No
5/12/96	Yes	Yes	No	Yes	SB	SB	SB	SB	No	No	75,387	44,441,567	NV	NV	0	No
5/13/96	No	Yes	No	Yes	1	2	3	SB	Yes	Yes	74,678	44,516,245	.88	.02	64	No
5/14/96	No	Yes	No	Yes	1	2	3	SB	Yes	No	75,878	44,592,123	.88	.02	65	No
5/15/96	No	Yes	Yes	Yes	1	2	3	SB	Yes	No	168,435	44,760,558	.72	.02	118	No
5/16/96	No	Yes	Yes	Yes	1	2	3	SB	Yes	No	168,108	44,928,666	.76	.02	124	No

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Calc Data = Yes if data is estimated for weekend.
Daily data is not recorded over weekends.

SB = standby, 1 = lead, 2 = lag, 3 = polishing
U = Undetected Value, S = Suspect Value

Influent = Tank 1 composite sample point
Effluent = Polishing column discharge sample point

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100-HR-3 Pump and Treat Operational Summary (Page 3 of 3)

6/13/96 11:48:28 AM

(Specified From Monday, January 01, 1996 to Thursday, June 13, 1996)

Date	Calc. Data	Extraction Wells In Use			IX Columns In Use				Injection Wells In Use		Liters Processed	Total Liters Processed	Influent Cr (mg/L)	Effluent Cr (mg/L)	Cr(6+) Removed (g)	Realignment	
		D5-14	D5-15	D5-16	T-100	T-200	T-300	T-400	D5-18	D5-19							
5/17/96	No	Yes	Yes	Yes	1	2	3	S/B	Yes	No	165,165	45,093,831	.8	.02	129	No	
5/18/96	Yes	Yes	Yes	Yes	SB	SB	SB	SB	No	No	164,619	45,258,450	NV	NV	0	No	
5/19/96	Yes	Yes	Yes	Yes	SB	SB	SB	SB	No	No	163,366	45,421,816	NV	NV	0	No	
5/20/96	No	Yes	Yes	Yes	1	2	3	S/B	Yes	No	163,911	45,585,727	.84	.07	126	Yes	
5/21/96	No	Yes	Yes	Yes	S/B	1	2	3	Yes	No	168,544	45,754,271	.84	0 U	142	No	
5/22/96	No	Yes	Yes	Yes	S/B	1	2	3	Yes	No	168,108	45,922,379	.92	0 U	155	No	
5/23/96	No	Yes	Yes	Yes	S/B	1	2	3	Yes	No	166,473	46,088,852	.88	0 U	146	No	
5/24/96	No	Yes	Yes	Yes	S/B	1	2	3	Yes	No	170,452	46,259,304	.84	0 U	143	No	
5/25/96	Yes	Yes	Yes	Yes	SB	SB	SB	SB	No	No	172,251	46,431,555	NV	NV	0	No	
5/26/96	Yes	Yes	Yes	Yes	SB	SB	SB	SB	No	No	172,796	46,604,351	NV	NV	0	No	
5/28/96	No	Yes	Yes	Yes	S/B	1	2	3	Yes	No	174,976	46,779,327	.92	.03	156	Yes	
5/29/96	No	No	No	No	1	3	S/B	2	Yes	No	0	46,779,327	0 U	0 U	0	No	
5/30/96	No	No	No	No					No	No	0	46,779,327	NV	NV	0	No	
6/3/96	No	Yes	Yes	Yes	3	S/B	1	2	Yes	No	205,992	46,985,320	1.12	0 U	231	No	
6/4/96	No	Yes	Yes	Yes	3	S/B	1	2	Yes	No	209,863	47,195,182	.88	0 U	185	No	
6/5/96	No	Yes	Yes	Yes	3	S/B	1	2	Yes	No	208,227	47,403,409	.92	0 U	192	No	
6/6/96	No	Yes	Yes	Yes	3	S/B	1	2	Yes	No	210,626	47,614,035	.96	0 U	202	No	
Total											6,574,095	Total					4,801

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Calc Data = Yes if data is estimated for weekend.
Daily data is not recorded over weekends.

SB = standby, 1 = lead, 2 = lag, 3 = polishing
U = Undetected Value, S = Suspect Value

Influent = Tank 1 composite sample point
Effluent = Polishing column discharge sample point

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APPENDIX A-3

Off-site Analysis Report

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100-HR-3 Offsite Analytical Summary (Page 1 of 1)

6/13/96 11:10:36 A

(Specified From Monday, January 01, 1996 to Thursday, June 13, 1996)

Sample Location	HEIS Sample Number	Date Sampled	Offsite Lab Results		Field Scrn Data	Comments
			Total Cr (mg/L)	Cr (6+) (mg/L)	Cr (6+) (mg/L)	
SP-10	B0GZ62	1/5/96	.934	.877	NS	
SP-10	B0GZ64	1/5/96	.823	.903	NS	
SP-300	B0GZ63	1/5/96	.772	.754	NS	
SP-300	B0GZ65	1/5/96	.72	.776	NS	
SP-10	B0GZ66	1/12/96	.713	NS	NS	
SP-400	B0GZ67	1/12/96	.473	NS	NS	
SP-10	B0GZ68	1/19/96	.803	NS	NS	
SP-10	B0GZ70	1/19/96	.837	.881	NS	
SP-200	B0GZ69	1/19/96	.282	NS	NS	
SP-200	B0GZ71	1/19/96	.284	.295	NS	
SP-10	B0GZ72	1/26/96	.828	NS	NS	
SP-200	B0GZ73	1/26/96	.644	NS	NS	

U = Undetected at specified detection limit.

B = The result value was less than the RDL, but was greater than or equal to the IDL.

UNKNOWN = Sample Location was not specified.

NS = Not Sampled

NR = No Results

* Cr(6+) - Field

Screening Not Loaded

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APPENDIX A-4
Field Screening Report

100-HR-3 Field Screening Report (Page 1 of 1)

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Chromium (6+) (mg/l)

6/13/96 11:08:07 A

(Specified From Monday, January 01, 1996 to Thursday, June 13, 1996)

Date	V4-10	V5-10	V6-10	V2-2	SP-10	SP-100	SP-200	SP-300	SP-400
3/27/96	.96	.6	.12	NS	.56	0 U	0 U	NS	NS
4/1/96	1.28	.84	.44	NS	1	.02	ND	NS	NS
4/2/96	1.32	.6	.4	NS	1	.08	ND	NS	NS
4/3/96	1.32	.92	.4	NS	.92	.14	ND	NS	NS
4/4/96	1.24	.8	.4	NS	1.12	.24	ND	NS	NS
4/5/96	1.44	NS	.4	NS	1.12	.2	ND	NS	NS
4/8/96	1.24	NS	.38	NS	1.28	.2	ND	NS	NS
4/9/96	1.36	NS	.4	NS	1.36	.18	ND	NS	NS
4/10/96	1.32	NS	.38	NS	1.24	.14	ND	NS	NS
4/11/96	NS	NS	NS	NS	NS	NS	NS	NS	NS
4/12/96	1.56	NS	.26	NS	1.36	.1	ND	NS	NS
4/15/96	1.24	NS	.26	ND	.84	.12	ND	NS	NS
4/16/96	1.28	NS	.24	ND	.84	.12	ND	NS	NS
4/17/96	1.56	NS	.28	ND	1.04	.13	.01 U	NS	NS
4/18/96	1.24	NS	.24	NS	.64	.13	.02	ND	NS
4/23/96	1.36	NS	.32	ND	.92	.08	.01 U	ND	NS
4/24/96	1.36	NS	.34	ND	1	.08	.02	ND	NS
4/25/96	1.36	NS	.3	NS	1	.1	.02	ND	NS
4/26/96	1.36	NS	.28	NS	.96	.12	.02	ND	NS
4/29/96	-1.28 U	NS	-.28 U	NS	.96	.13	.02	ND	NS
4/30/96	1.28	NS	.26	NS	-.92 U	.18	.04	.01 U	NS
5/1/96	1.28	NS	.28	NS	.8	.16	.04	.02	NS
5/2/96	1.32	NS	.3	NS	.92	.16	.04	.02	NS
5/3/96	1.4	NS	-.4 U	NS	1.24	.2	.04	.02	NS
5/6/96	1.32	NS	-.28 U	NS	.92	.2	.05	.01 U	NS
5/7/96	1.32	NS	.26	NS	.84	.24	.06	.01 U	NS
5/8/96	1.32	NS	.26	NS	.92	.24	.07	.01 U	NS
5/9/96	1.28	NS	.26	NS	.92	.25	.08	.01 U	NS
5/10/96	1.32	NS	.26	NS	.92	.25	.08	ND	NS
5/13/96	1.28	NS	.28	NS	.88	.24	.1	.02	NS
5/14/96	1.28	NS	.26	NS	.88	.25	.13	.02	NS
5/15/96	1.32	.56	.26	NS	.72	.18	.09	.02	NS
5/16/96	1.32	.72	.26	NS	.76	.2	.11	.02	NS

ND = Non Detected
NS = Not in Service

1 = lead, 2 = lag, 3 = polishing

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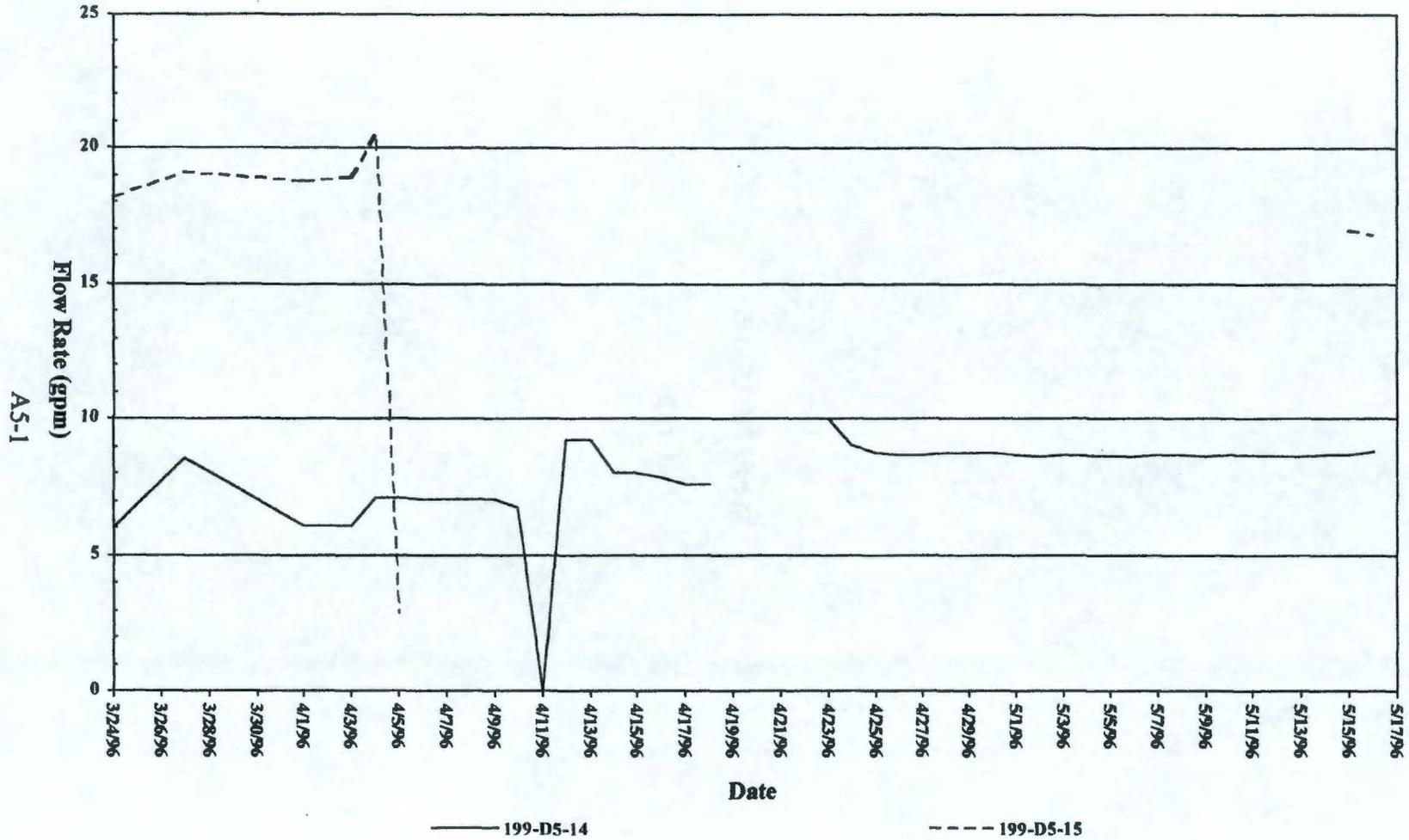
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APPENDIX A-5

Graphs

100-HR-3 Average Well Flow Rate Flow

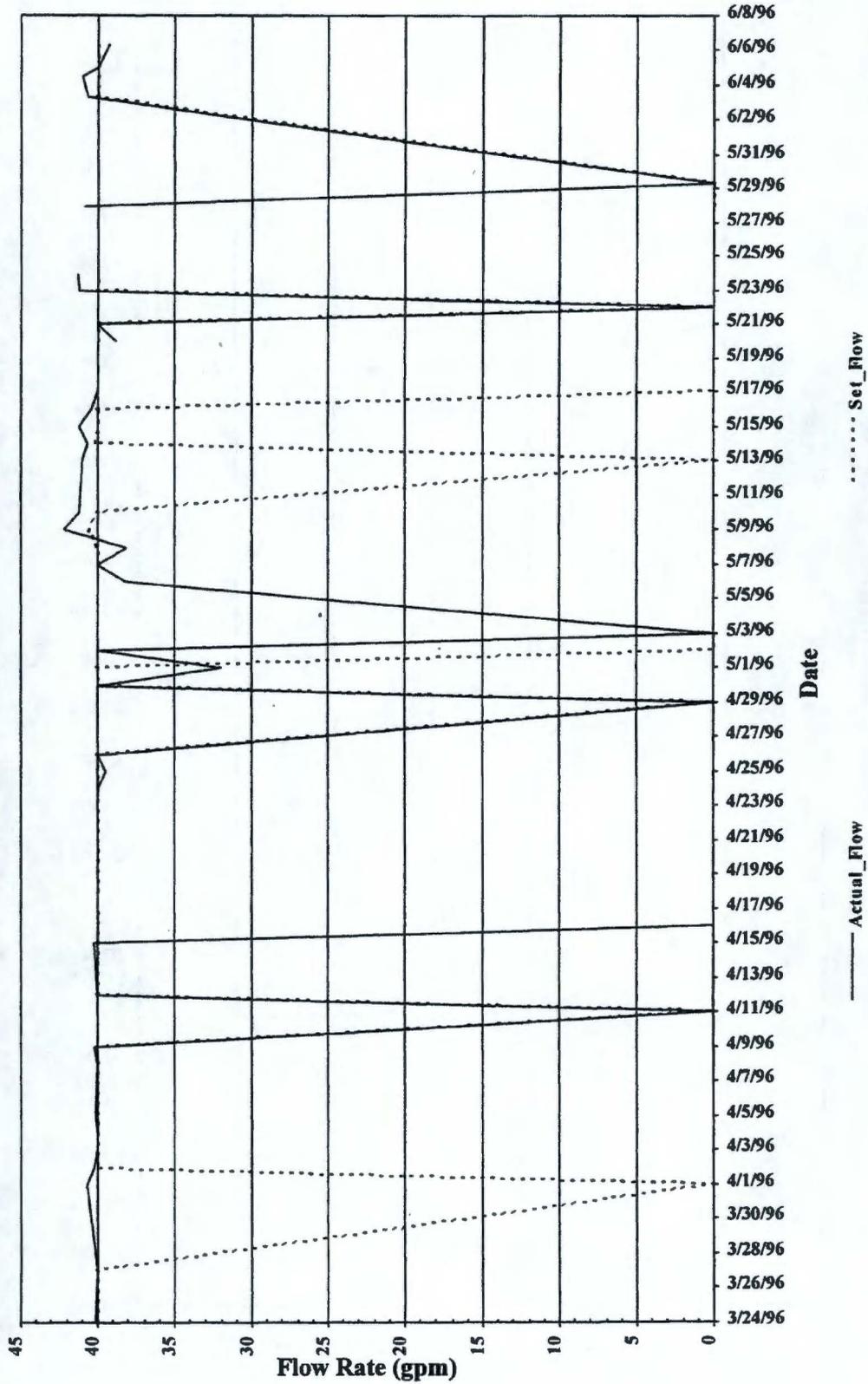
(Specified From Monday, January 01, 1996 to Sunday, June 16, 1996)



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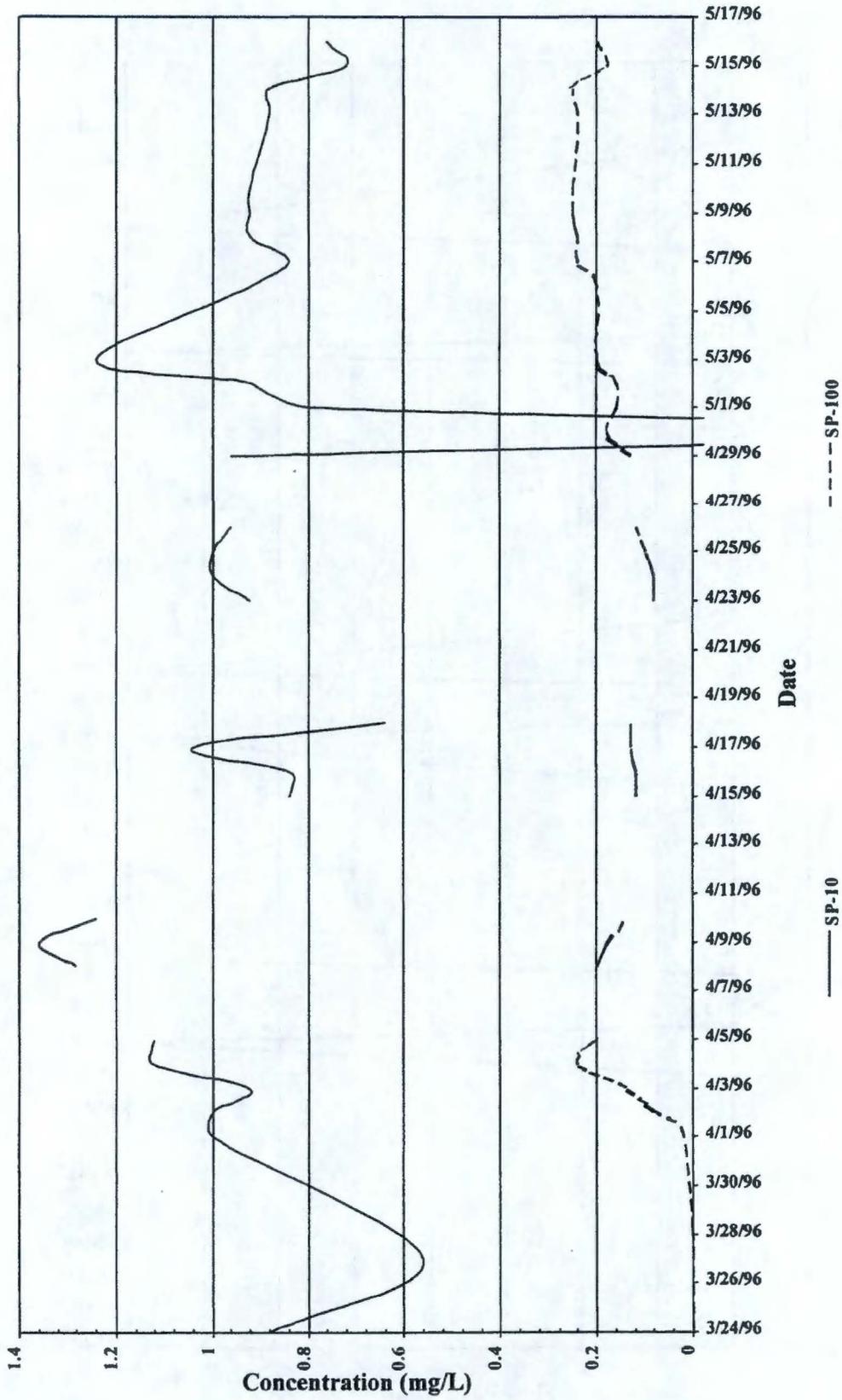
100-HR-3 Average Ion Exchange Unit Flow Rate Plot

(Specified From Monday, January 01, 1996 to Friday, June 14, 1996)



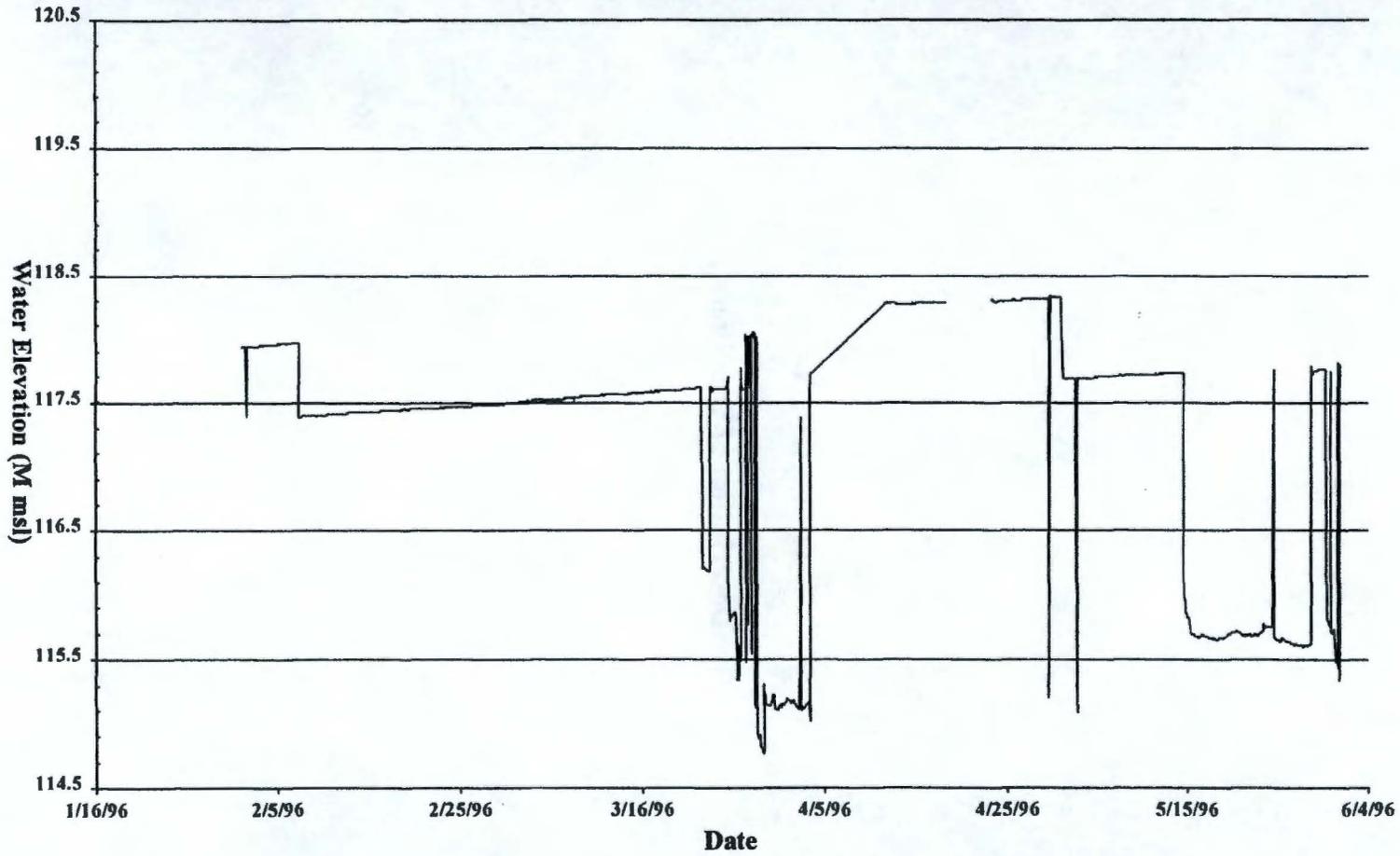
100-HR-3 Concentration vs Time Plot

(Specified From Monday, January 01, 1996 to Friday, June 14, 1996)



100-HR-3 Well Hydrograph D5-15

(Specified From Monday, January 01, 1996 to Thursday, June 13, 1996)



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APPENDIX A-6
Description of Qualifiers

CLP Data Qualifiers - Organics (Format Type CLP, Form Numbers 1A, 1B, 1C, 1D, 1F)

Qualifier	Definition
B	The analyte is found in the associated blank as well as in the sample. It indicates possible contamination of the blank and warns the data user to take appropriate action. Should be replaced by "J" during validation.
D	Analysis was performed at a secondary dilution factor.
E	Identifies compounds whose concentrations exceed the calibration range of the GC/MS for that specific analysis.
J	The associated numerical value is an estimated quantity. The mass spectral data indicate the presence of a compound that meets the identification criteria, but the result is less than the contract-required quantitation limit and greater than zero.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
R	The data are unusable.
U	Undetected - Analysis did not detect the material. The associated numerical value is the contract-required quantitation limit corrected for dilution and percent moisture.
UJ	The material was analyzed for, but was not detected. The contract-required quantitation limit is estimated. GC/MS = gas chromatograph/mass spectrometer.

CLP Data Qualifiers - Inorganics (Format Type CLP, Form Number I).

Qualifier	Definition
B	Reported value is less than the contract-required quantitation limit but is greater than the instrument detection limit. Should be replaced by "J" during data validation.
BJ	Reported value is less than the instrument standardization but is greater than the instrument detection limit. Should be replaced by "J" during data validation.
J	The analyte was analyzed for and detected. The associated numerical value is an estimated quantity usable for decision-making processes.
N	Spike sample recovery is outside control limits. Presumptive evidence of the presence of the analyte.
R	The data are unusable.
U	Undetected - Analyte is below the detection limits of the methods and instruments used. The associated numerical value is the calculated contract-required quantitation limit based on wet weight of the soil sample. The contract-required quantitation limit based on dry weight (stated in the work plan) is higher.
UJ	The material was analyzed for but was not detected. The contract-required quantitation limit is estimated.

LAS Data Qualifiers

Qualifier	Definition
L	Used when an analytical result below a CRQL and at or above an MDL is reported.
U	Indicates compound was analyzed for but not detected. The sample quantitation limit is corrected for dilution and for percent moisture.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit and greater than zero. The sample quantitation limit is corrected for dilution and for percent moisture as in the "U" flag.
C	Applies to pesticide results where the identification has been confirmed by GC/MS. Single component pesticides > 10 ng/ul in the final extract shall be confirmed by GC/MS.
B	Used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a TCL compound.
E	Identifies compounds whose concentration exceed the calibration range of the GC/MS for that specific analysis. This flag does not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and reanalyzed. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported.
D	Identifies all compounds identified in an analysis at a secondary dilution factor.
A	Identifies a TIC as a suspected aldol-condensation product.

X Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the Sample Data Summary Package and Case Narrative. Begin by using "X." If more than one flag is required, use "Y" and "Z" as needed.

NOTE: The qualifiers "B" and "U" are mutually exclusive; therefore, there can never be a qualifier of "BU.

CRQL = contractually required quantitation limit.

EC = eddy current (flowmeter).

GC = gas chromatograph.

MDL = maximum detectable limit.

MS = mass spectrometer.

PCB = polychlorinated biphenyl(s).

TCL = target compound list.

TIC = tentatively identified compound.

Reference - EPA (1988a).

LAS Data Qualifiers (for Lab Code "US Test" only)

Qualifier	Definition
-----	-----
U	Used in reporting radiological data in which the data values are less than or equal to the counting error.
<	Used in reporting data that are less than the contractual detection limit.
#	Used in reporting data that are less than the contractual detection limit but still quantifiable.
>	Used in reporting data that are greater than the contractual detection limit but not quantifiable above some upper limit.

FEAD Data Qualifiers

A laboratory-generated character string containing characters in combinations that qualify the associated result. Different forms have different combinations of valid qualifiers; however, B and U are mutually exclusive qualifiers on all forms.

Additionally, the following three qualifiers are applicable to all forms:

- X Manually entered or modified result.
- Y See hard copy case narrative for important note associated with this result.
- Z Other; see hard copy case narrative for note associated with non-result fields.

FEAD Data Qualifiers - Inorganics: (Format Type FEAD, Form Number I)

- B The result value was less than the Required Detection Limit (RDL), but was greater than or equal to the IDL.
- E The reported value is estimated because of the presence of interference. An explanatory note must be included with the hard copy case narrative (defined in the applicable Statement of Work [SOW]) and must specify the sample number, Form number I, and CAS number.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA). Note: The qualifiers S, W, and + are mutually exclusive and cannot exist in combination (for example, S+, SW, are not allowed).
- U The analyte was analyzed for but not detected at or above the statistically adjusted IDL. Report the IDL corrected for percent solids, aliquot size and dilution factor as appropriate for the sample media.

W Post-digestion spike for Furnace Atomic Absorption (AA) analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance. Note: See Exhibit E, USEPA Contract Laboratory Program SOW for Inorganics Analysis, document number ILM02.0. Note: The qualifiers S, W, and + are mutually exclusive and cannot exist in combination (for example, S+, SW are not allowed).

* Duplicate analysis not within control limits.

+ Correlation coefficient for the MSA is less than 0.995.

FEAD Data Qualifiers - Organics (Format Type FEAD, Form Numbers A, B, D)

A The TIC is a suspected aldol-condensation product.

B The analyte was found in the associated laboratory blank as well as in the sample. It indicates possible contamination of the sample and warns the data user to take appropriate action.

C The identification of a pesticide has been confirmed by gas chromatograph/mass spectrometer (GC/MS). However, if GC/MS confirmation was attempted but unsuccessful, do not use this flag; instead use the Y qualifier.

D The analysis was performed at a dilution factor other than the primary (secondary or greater).

E The concentration of the compound exceeded the calibration range of the GC/MS.

J The result value is an estimate. The mass spectral data indicates the presence of a compound that meets the identification criteria, but the result is less than the RDL and is greater than zero.

U The analyte was analyzed for but not detected at or above the statistically adjusted MDL or IDL. Report the MDL corrected for percent solids, aliquot size and dilution factor as appropriate for the sample media.

**FEAD Data Qualifiers - Radchem: (Format Type FEAD,
Form Numbers R)**

- U The analyte was analyzed for, but the result is less than the MDA. This includes the gamma-scan case when the radionuclide was analyzed for and not detected.
- J The result value is an estimate. No U qualifier has been assigned and the result is below the RDL.
- B This sample result has an associated laboratory reagent blank result that is non-U.

**FEAD Data Qualifiers - Wetchem: (Format Type FEAD, Form Numbers
W)**

- U The analyte was analyzed for, but not detected at or above the statistically adjusted MDL/IDL. Report the MDL/IDL corrected for percent solids, aliquot size and dilution factor as appropriate for the sample media.
- B The detected amount of the analyte being tested is less than the RDL, but greater than or equal to the MDL/IDL.

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