Laboratory Report File Specification wtx_2.0 (flat file)

Updated: October 2018

Contents

Laboratory Data Report File Format: WTX_2.0

File Version: 2.0
Description: simple delimited ASCII flat file representing one report containing any number of samples

General Concepts

- A file represents a "report", analogous to a paper report that would traditionally be supplied to a client. As such, only one client can be identified in each report file.
- Each report is a unique entity.
- A report can contain any number of samples, any number of different analyte tests per sample, and can contain results for different drinking water systems or different wastewater systems. Note that a report CANNOT contain results for both drinking water systems and wastewater systems.
- If a sample is tested more than once for a particular analyte, the results of each test can be reported only if the analytical methods are reported, and are different.
- Each line in the file represents one analyte test result in its entirety, and although there is no interdependence between the lines of a file several of the fields will by necessity be identical in each line.
- The file (and WaterTrax in general) supports the transfer of the results of measurements conducted on samples submitted by clients, but not QA/QC data such as surrogate sample or travel blank results.
- It is optionally possible to include an HTML text-only "image" of the report to reflect lab-specific formatting or other information not transmitted in the data fields of the file.

Updating Report Data

- A report file can be submitted as an original, or a replacement. This status applies to the entire report file, not individual lines. When a replacement is submitted, all original data will be replaced with the contents of the replacement file.
- A replacement file may be additive to its original file in terms of samples or the analytes tested for each sample. In other words, a replacement file may include analytes that are additional to the samples in the original file, and samples that are additional to the original file.
- A report file cannot be subtractive to its original file in terms of samples or the analytes tested for each sample. A replacement file with fewer lines than its predecessor will be rejected. The only way to delete information from a report is to delete the entire report.
- A replacement file can be used to update the analytical result (value and/or units) for any sample and/or test analyte that was provided in the original report file, or to report on additional samples and/or additional analytes. Analytical methods cannot be changed by submitting a replacement report.

- Each analytical result value can be designated as Preliminary or Final. If nothing is specified, final is assumed. To update a preliminary result to final, the report file must be resubmitted as a replacement with the appropriate lines flagged as "final".

File Format

- ASCII file
- Fields delimited with the pipe "|" character
- Any optional fields left empty must be fully delimited (eg. "||") with the exception of the last field which will be accepted with or without a trailing delimiter.
- End of line character is carriage return/line feed
- Commas must not be used within any of the text fields

File Name

- Extension must be "txt"
- No requirements for file name, but the use of a unique report identifier is recommended (see "Report ID" field). It is also advisable to keep the name as as short as possible.

File Fields

- The table following summarizes the report file field order, name, format, and purpose.
- Shaded fields indicate those that will be identical in each line of the report.
- Non-italic fields are those that can be updated by submitting a replacement file.
- Bold-Italic fields indicate those that cannot be changed by submitting a replacement file.
- Fields surrounded with thick lines define sample characteristics and therefore will be identical in each line of the file that pertains to a given sample. All of the lines that pertain to a sample must be grouped together in the file.

	No.	Field Name	Status	Format	Purpose/Comment	Source of Information
"Report Header" fields (except No. 7)	1	***Version No.***	Required	Text	="WTX_2.0" for this file format	WaterTrax
	2	Transaction Purpose	Required	Text	="O" original, "R" replacement	Laboratory
	3	Value Status	Optional	Text	="P" preliminary, "F" final, "F" is default	Laboratory
	4	***WTX Lab ID***	Required	Number	Assigned by WaterTrax to uniquely identify each laboratory	WaterTrax
	5	Notify Email	Optional	Text (256 chars)	Email address to which error reports fo this file should be sent. Either this field should be used, or the Confirmation / Error email address should be set on the lab's home page	Laboratory
	6	***WTX Client ID***	Required	Number (max 5 chars)	Identifies the WaterTrax client for which the report was prepared	Client on Req. form
	7	Sampling Point Locator	Required	Text (max 6 chars)	Uniquely identifies the sampling point within WaterTrax.	Client, on Req. form
	8	***Report ID***	Required	Text (15 chars)	Uniquely identifies the laboratory report and the file - invoice number, filing number, or other lab tracing code is suggested for use	Laboratory
	9	Report Name	Optional	Text (256 chars)	Title or name of laboratory report	Laboratory
"Sample Header" fields (plus No. 7)	10	***Sample ID***	Required	Text (30 chars)	Identifies the sample uniquely within the report file. Usually either a LIMS-issued sample ID or a client-supplied sample	Req. form or Laboratory
	11	Group ID	Optional	Text (15 chars)	A laboratory-assigned tracking ID (may be a batch number, etc.)	Laboratory
	12	Collection Date	Required	mmddyyyy (client.watertrax.com) ddmmyyyy (auclient.watertrax.com)	Date sample taken Note: leading zeros must be included	Req. form
	13	Collection Time	Optional*	hhmmss, hhmm, hh:mm:ss, hh:mm	Time sample taken Note: leading zeros must be included if the colon separator is not used	Req. form
	14	Lab Sample Comment	Optional	Text (1000 chars)	Comment on the condition of the sample bottle(s) or its contents, and/or Sample/Site location description etc.	Req. form or Laboratory
	15	Analysis Type	Optional	Text (code)	• NA=not applicable • RFS = raw field sample • RDS=raw duplicate field sample • TFS=treated field sample • TDS=treated duplicate field sample	Req. form
An	16	***Analyte Code***	Required	Number (code)	Identifies the test analyte using the WaterTrax Analyte Code list	Laboratory

	17	Value	Required	Number / Text (code)	Test result, numeric or: • ND=non-detect (< field 21) • U=non-detect • numberU=non-detect result with detection limit (number is detection limit, U is non-detect result) • OR=over-range (> field 21) • NT=not tested • NR=no result • IG=ignore (no record created) • P=presence • A=absence • PR=presumptive • Y=yes • N=no • OG=overgrown (implies no result) • TNTC=too numerous to count • DLTnumber (result is detected, and less than) • DGTnumber (result is detected, and greater than) • ER="external report" (result will be found in another (i.e. external) report) • SC="see comment" (narrative result is provided as text in field 19) • Note that OG,P,A,and PR are applicable to microbiological analytes only as indicated in the analytes and units list..	Laboratory
	18	Units Code	Required	Number (code)	Units for test result AND detection limit using WaterTrax Units Code list	Laboratory
	19	Lab Result Comment	Optional	Text (256 chars)	Comment on the analytical test result reported.	Laboratory
	20	Analytical Method	Optional*	Text (256 chars)	Name ofthe analytical method used to measure or detect the analyte. Should not be an internal lab code which has no meaning to client. *Note that if multiple results for a particular analyte are to be reported for a given sample, the analytical method must be provided for each occurrence of the analyte, and must be unique for each occurrence of the analyte.	Laboratory
	21	Detection Limit	Optional*	Number	Detection limit for instrument or method used, reported in same units as test result. Recommended for use with non- detect (ND) and over-range (OR) values in field 17.	Laboratory
	22	Field Result	Optional*	Text (code)	Indicates if the result was provided by the client on the requisition form and is only being "passed through" by the lab • Default is N ("N" = No) • Allowable is Yes or No ("Y" or "N") If not supplied, contents of Field 19 are be interpreted to infer Field Result.	Laboratory
	23	Analysis Start Date	Optional	mmddyyyy (client.watertrax.com) ddmmyyyy (auclient.watertrax.com)	The date of the start of analysis of the sample for the analyte in question.	Laboratory
	24	Analysis Start Time	Optional	hhmmss or hhmm	The time of the start of analysis of the sample for the analyte in question.	Laboratory
	25	Analysis End Date	Optional	mmddyyyy (client.watertrax.com) ddmmyyyy (auclient.watertrax.com)	The date of the end of analysis of the sample for the analyte in question.	Laboratory
	26	Analysis End Time	Optional	hhmmss or hhmm	The time of the end of analysis of the sample for the analyte in question.	Laboratory

	27	Reporting Limit	Optional	Number	Optional field. Used by a laboratory may be from the analytical method, derived specifically for that laboratory, instrument or sample matrix; or as directed by a regulatory agency.	Laboratory
	28	Unused	Optional		For future use. Contents ignored.	
	29	Unused	Optional		For future use. Contents ignored.	
	30	Sample Collector	Optional*	Text (??? chars)	Name of the person who collected / submitted the sample.	Req. form

* fields that while optional, are recommended for inclusion as most clients require them to be reported.

"Detected, Less Than" and "Detected, Greater Than" Results

Analytical results that are "less than" a specified value but not considered a Non-Detect, or "greater than" a specified value but not considered an Over-Range can be reported in Field 17 using the "DLT" and "DGT" characters. See Field 17 in the table above for details. It is important to be specific, and to ensure that Non-Detects and Over- Ranges are properly reported using the ND and OR codes.

Less than results are displayed in WaterTrax as "<<number", and greater than results are displayed as ">>number". This distinguishes these types of results from non-detects (displayed as "<detection_limit") and over-ranges (displayed as ">detection_limit").

"External Report" and "See Comments" Results

Please do not use the codes without contacting WaterTrax to confirm your application.

WaterTrax Analyte and Unit Codes

As there are no industry standards, WaterTrax uses a unique number to identify each water quality analyte and its appropriate reporting units For example, total arsenic is number 26, while an appropriate unit code would be 111 (for mg/l). The WaterTrax Analyte and Unit Code List can be viewed on the Laboratory Homepage on WaterTrax. The WaterTrax analyte list is very specific, in many cases more specific that laboratory LIMS systems (e.g. there are six different reportable forms of Arsenic). It is important that a qualified laboratory analyst assist in matching the laboratory's analyte/parameter/method/test codes to the WaterTrax codes.

Field Results

If an analytical result (e.g. chlorine residual, temperature, or other measurement taken in the field) is reported by the client on the requisition form, and the lab is "passing through" the result to WaterTrax, the result is a "Field Result". Flagging field results in Field 22 ensures that the result will not be misconstrued as a result of the laboratory's analysis.

Error Checking

Upon receipt of a file, the WaterTrax system examines it for errors. If errors are found, a descriptive email is sent to the email address indicated within the file. If no email address is provided within the file, the Laboratory Administrator's email address is used. Each line of the file is checked for the following items upon file receipt:

1. The WTX Lab ID must be valid.
2. The WTX Client ID and Sampling Point Locator must properly correlate.
3. If marked as an original report file, the Report ID must not have been used previously by the Laboratory. This ensures that WaterTrax's database and the Laboratory filing system are in synch, and that paper reports can be cross- referenced with electronic data. If a report is deleted from WaterTrax (this can be done from the Laboratory Home Page, the Report ID can then be reused).
4. The required fields (as identified in the table above) must all be present and contain valid information. Optional fields can be provided at the Laboratory's discretion, and left empty if not used.
5. The Units code must be appropriate for the Analyte code provided. WaterTrax enforces units rules for each analyte.
6. The Value field must be numerical or one of the allowable qualitative indicators.
7. If the report file is flagged as a replacement, an original must have been submitted previously.
8. If marked as a replacement report file, all of the lines included in the predecessor file must be present.
9. "Sample Header" fields (as identified by common SampleIDs) are checked to ensure that they are identical. The file will be rejected unless all lines with identical SampleIDs are grouped.
10. "Report Header" fields are checked to ensure they are identical.

If a file contains errors in any line, the file will be rejected and no data is loaded into WaterTrax. The file can therefore be corrected and resubmitted without concern for duplicating data in WaterTrax.

Submitting an HTML Report Image

An HTML text-only report "image" can be submitted if the laboratory wishes to allow their clients to optionally view the report with lab-specific formatting or with other comments or information that is not included in the data fields listed above. Please note that the data fields are what is used to populate the client's water system databases, the image is merely a graphical representation. WaterTrax is not able to check or correlate the information contained in the data fields to the information that may be contained in the image. It is therefore recommended that the report image not be used unless a client specifically requests it, as there is a risk that the image may get out of step with the live data. It is the responsibility of the laboratory to ensure that the image is updated to correspond to any updates made to a report by means of a replacement file submission.

Note: the maximum allowable length of the HTML image is 3,000 characters. A file will not be

accepted if the image is longer than this.

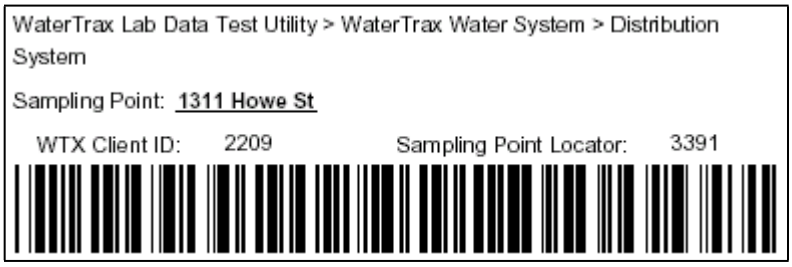
To submit a report image, the HTML code that makes up the report image is to be submitted immediately after the data lines. The HTML code must be delimited as follows:

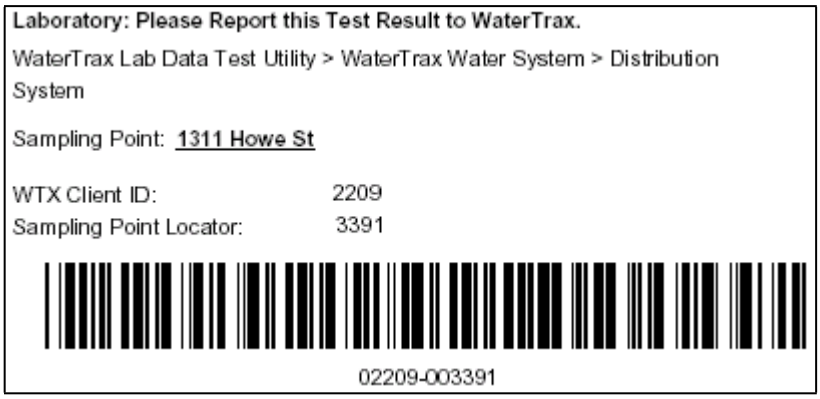
```
last data line here
<HTML>
...html code for report image here...
</HTML>
```

The HTML code must be self-contained and self-referencing and not contain any links to websites or other external resources such as graphics.

Requisition Form Implications

In addition to the standard information contained on each laboratory's requisition/chain of custody forms, laboratory clients must provide the laboratory with the key locational fields necessary to complete the file format indicated above. These are the WTX Client ID and Sampling Point Locator. To facilitate this, WaterTrax allows its clients to produce a sampling point information label called the "Tracking Information Label" printout, examples of which follow:





The two pieces of locational information required to report to WaterTrax (WTX Client ID and Sampling Point Locator) are shown in the text and are also provided in a barcode. WaterTrax recommends that clients attach these labels to the requisition form for each sample, allowing laboratories to use the barcode to enter WTX Client ID and Sampling Point Locator into their LIMS. However, it is also possible for clients to simply write these two numbers on the requisition form. The placement of labels and use of the requisition form should be discussed and agreed upon with each client.

Proprietary Information

The WaterTrax report file specifications, analyte codes, and unit codes are proprietary and may only be used by Data Partner laboratories to submit client data to WaterTrax. Use for any other purpose without written authorization from WaterTrax Inc. is prohibited.

Document Revision History

Nov 16 2002	added HTML image
Nov 22 2002	added sample characteristics
Dec 3 2002	added note on commas
Jan 21 2003	added note on lines with SampleIDs needing to be grouped, removed sample characteristics pending release
Jan 29 2003	corrected table to show Field 7 as text, not numeric (hex number) March 4
2003	added IG code
May 21 2003	added section on less than and greater than results
Oct 11 2003	allow additive report files Oct
16 2003	added ER and SC codes Oct
29 2003	added fields 22-28
Dec 5 2003	changed to DLT and DGT from < and > to prevent lab errors
March 30 2004	allow multiple occurrences of an analyte within a sample, if analytical methods are different March 30 2004 note re: temporary acceptance of replacement files with duplicate records (removed Feb. 2007) May 14
2004	refined definition of Sample ID, field 10.
July 28 2004	modified description of what should be provided in Analytical Method field
Jan 13 2004	added fields 29 and 30.
Feb 24 2004	added colon-delimited time formats
Feb 24 2005	consolidation of new fields and features
May 3 2006	modified Group ID field 11 to allow field value to be different within the same sample
Feb 20, 2007	added new non-detect result codes “U” and “number U” April
16, 2007	added new result code TNTC (too numerous to count)
April 15, 2008	field 14 updated to allow 1000 characters (previous limit was 256)
January 27, 2009	results for drinking water systems and wastewater systems cannot be included in the same Lab Report
February 26, 2013	added field 27 (Reporting Limit)
September 12, 2017	added Yes(Y) and No(N) values for field 17
October 2, 2018	added note for Australia date format

Example Fields and Sample Files

The following table provides example fields for reporting of a final total arsenic test result of 0.23 mg/l for WaterTrax client number 234.

No.	Field Name	Status	Example	Comment
1	Version No.	Required	WTX_2.0	
2	Transaction Purpose	Required	O	Indicates that this is the original submission of this report.
3	Value Status	Optional	F	Indicates that the report is Final.
4	WTX Lab ID	Required	42	Do not disclose this number to clients or other labs.
5	Notify Email	Optional	labtech@lab.com	
6	WTX Client ID	Required	234	Identifies the client for whom the report is destined.
7	Sampling Point Locator	Required	5434	Identifies the sampling point location or site in the Watertrax database.
8	Report ID	Required	AZ-F23S	Assigned by the lab, must be unique for each report. Used by WaterTrax, clients, and labs to identify and discuss report contents if necessary.
9	Report Name	Optional	Water Analysis	
10	Sample ID	Required	1	Often clients will identify each sample on the req. form. Alternatively, the lab may identify the sample. Used to distinguish between each sample contained in a report.
11	Group ID	Optional	Cooler 42	Suggested use is to reference in-lab QA/QC references such as batch numbers etc.
12	Collection Date	Required	12312001	
13	Collection Time	Optional	0930	
14	Lab Sample Comment	Optional	Not properly sealed	Suggested use is for the condition of the sample upon arrival, or for global findings/recommendations for each sample.
15	Analysis Type	Optional	na	
16	Analyte Code	Required	26	
17	Value	Required	0.23	
18	Units	Required	111	
19	Lab Result Comment	Optional	No concerns	Suggested use is to report comments on findings or recommendations for each analyte.
20	Analytical Method	Optional	Method 42	
21	Detection Limit	Optional	0.1	Units must match those supplied in Field 18

Translated into the delimited ASCII file format, this report looks like:

WTX_2.0|O|F|42|labtech@lab.com|234|5434|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|26|0.23|111|No concerns|Method 42|0.1

A report on four analytes for this same sample could look like:

WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|26|0.23|111|No concerns|Method 42|0.1

WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|33|1.65|111|No concerns|Method 99|1
WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|124|2.23|111|No concerns||0.1
WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|423|24.98|111|No concerns||1

A report on two samples from different locations, two analytes each could look like:

WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|26|0.23|111|No concerns|Method 42|0.1
WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|73|8.54|111|No concerns|Method 4|0.5
WTX_2.0|O|F|42|labtech@lab.com|234|5554|AZ-F23S|Water Analysis|2|Cooler 42|12312001|0930|Good seal|na|26|0.47|111|No concerns|Method 42|0.1
WTX_2.0|O|F|42|labtech@lab.com|234|5554|AZ-F23S|Water Analysis|2|Cooler 42|12312001|0930|Good seal|na|73|7.52|111|No concerns|Method 4|0.5

The same report accompanied with a report image would look like:

WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|26|0.23|111|No concerns|Method 42|0.1
WTX_2.0|O|F|42|labtech@lab.com|234|5334|AZ-F23S|Water Analysis|1|Cooler 42|12312001|0930|Not properly sealed|na|73|8.54|111|No concerns|Method 4|0.5
WTX_2.0|O|F|42|labtech@lab.com|234|5554|AZ-F23S|Water Analysis|2|Cooler 42|12312001|0930|Good seal|na|26|0.47|111|No concerns|Method 42|0.1
WTX_2.0|O|F|42|labtech@lab.com|234|5554|AZ-F23S|Water Analysis|2|Cooler 42|12312001|0930|Good seal|na|73|7.52|111|No concerns|Method 4|0.5
<html>
- html code for report image goes here -
</html>