SURFACE WATER DATA SUBMITTAL GUIDANCE DOCUMENT

May 2004

Prepared by:

Arizona Department of Environmental Quality
Water Quality Division and Waste Programs Division
Hydrologic Support and Assessment Section

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(Updates of these lookup tables can be downloaded from ADEQ's web site:
http://www.adeq.state.az.us/environ/water/assessment/index.html)

I. Introduction

To assess the quality of surface and ground water in Arizona, the Arizona Department of Environmental Quality (ADEQ) must assemble and evaluate all existing and readily available water quality related data and information. Much of the data used in the assessment is collected by other monitoring entities. To facilitate a timely and accurate assessment of the data, data being considered for the assessment must be submitted electronically and entered into ADEQ's Surface Water Quality Database.

A Groundwater Data Submittal Guidance Document (version 3.1 – December 2003) was created by ADEQ's Superfund Programs Section to facilitate uploading of Superfund related ground water quality data collected by environmental consultants. It describes the format and procedures for the electronic submittal of ground water data. You can download this guidance document at: http://www.adeq.state.az.us/function/forms/appswaste.html#superfund.

This Surface Water Data Submittal Guidance Document (February 2004) is a revision of the ground water document to facilitate electronic submission of surface water quality data. The goals of developing this guidance were to institute procedures that:

- Will be minimally burdensome to facilities submitting data, recognizing that this submission generally is voluntary in nature, unless required under a permit or compliance order;
- Will create minimal burden on ADEQ staff to load the monitoring site and associated water quality data;
- Will allow ADEQ to efficiently manage and use the data for required water quality assessments and modeling; and
- Will provide clear submittal methods to ensure consistency in data entry.

To ensure consistency, many of the fields being requested have a pre-defined list of entries. These pre-defined lists are included in the Appendix of this document. Updates will be available at ADEQ's website: http://www.adeq.state.az.us/environ/water/assessment/index.html.
Although this guidance document focuses on water chemistry data, ADEQ will accept a wide variety of data, including:

Water chemistry and physical characteristics of surface and ground water,
Algae,
Aquatic life tissue (e.g. fish tissue samples),
Bioassessment and habitat, and
Geomorphology (physical integrity)

Data submitted will be managed in ADEQ's Surface Water Quality Database and become public record. As public records, these data will be available to all interested parties in both electronic and print media.

II. ASSISTANCE

For assistance with surface water data submissions or if you have questions or comments regarding this document, you may contact ADEQ's Surface Water Monitoring Data Submittal Coordinators:

Melanie Diroll
(602) 771- 4616
Toll free: 1-800-234-5677 (extension 771-4616)
Email: diroll.melanie@ev.state.az.us

Diana Marsh
(602) 771-4545
Toll free: 1-800-234-5677 (extension 771-4545)
Email: marsh.diana@ev.state.az.us

Any questions or comments concerning Superfund ground water data submittals can be directed to ADEQ's Superfund Programs Section Data Submittal Coordinator:

Lowell Carty
(602) 771-4413
Toll free: 1-800-234-5677 (extension 771-4413)
Email: carty.lowell@ev.state.az.us

Questions concerning submission of other ground water data can be directed to:

Wang Yu
(602) 771-4552
Toll free: 1-800-234-5677 (extension 771-4552)
Email: yu.want@ev.state.az.us

This surface water submittal guidance document and updates for look-up tables can be downloaded from ADEQ's web site at: http://www.adeq.state.az.us/environ/water/assessment/index.html.

The ground water submittal guidance document and updates for look-up tables can be downloaded from ADEQ's website at: http://www.adeq.state.az.us/function/forms/appswaste.html#superfund.

Training classes for data submittal will be made available as needed through these coordinators.

III. Data Submission Process

ADEQ needs a variety of supporting information to properly use surface water quality data. The following chapters provide detailed information about this metadata. When submitting surface water quality data, please provide the following:

- The surface water data transmittal form (following page);
- Quality Assurance Plan and Sampling Analysis Plan for sampling period (unless already on file with ADEQ) (details in Appendix B);
- Assurance that the Quality Assurance Plan and Sampling Analysis Plan were followed, including assurance that monitoring and laboratory staff were adequately trained and supervised (part of the Credible Data requirements in Appendix B);
- Monitoring site information (details in Section V);
- Electronic water quality data submittal in AXCII fixed-width format (details in Section VI); and
- Any other information needed to properly interpret the water quality data.

SURFACE WATER DATA TRANSMITTAL FORM

Submit this form with each electronic data submission. This form can be electronically downloaded from ADEQ's web site at http://www.adeq.state.az.us/environ/water/assessment/index.html.

Direct transmission form and electronic data to: Melanie Diroll, Surface Water Data Submittal Coordinator, diroll.melanie@ev.state.az.us. If questions, please contact Melanie at (602) 771-4616 or toll free at 1-800-234-5677 - extension 771-4616), or contact Diana Marsh at (602) 771-4545 (toll free at 1-800-234-5677 – extension 771-4545, email marsh.diana@ev.state.az.us.

Submitting Agency	
Submittal Contact (Name, phone number, email address)	
Monitoring Purpose	
Sampling Period (beginning and ending dates)	
Data Type (Stream, lake, or spring water quality data, biocriteria and habitat data, fish (or other) tissue data, other data)	
A Quality Assurance Plan (QAP) and a Sample Analysis Plan (SAP) for this monitoring period have been submitted to ADEQ. (If not, indicate who will be submitting these.)	
Contact for questions concerning the QAP or SAP (Name, phone number, email address)	
Comments Attach other information necessary for ADEQ to evaluate the data unless they are submitted as part of the monitoring data (e.g., field comments, lab comments, lab notation codes, data validity comments, flow conditions, field conditions).	

I (_____), _____ (position), provide assurance that the methods and procedures specified in the Quality Assurance Plan and Sample Analysis Plan submitted (or being submitted) to ADEQ were followed. This assurance includes that all monitoring and laboratory staff were adequately trained and supervised. _____ (date)

(Note: This assurance is required.)

IV. Credible Data Requirements

ADEQ's "credible and scientifically defensible data" requirements are established in Arizona's Administrative Code R18-11-602. A reader-friendly version of ADEQ's credible data requirements is provided in Appendix B.

Data that does not meet these requirements may be entered into the database, but must be "flagged," as this data cannot be used to identify impaired waters or for TMDL modeling.

As indicated in the previous section, the monitoring entity must provide documentation and assurances that the data being submitted meet quality assurance and quality control standards established in Arizona's credible data rule. This is accomplished by submitting with the data:

- A copy of the Quality Assurance Plan (QAP) and the Sample Analysis Plan (SAP) used during the monitoring period;
- Other information necessary for ADEQ to evaluate the data (e.g., field comments, lab comments, lab notations, data validity comments, flow conditions, field conditions) unless this information is being submitted as part of the monitoring data;
- Written assurances that methods and procedures established in the QAP and SAP were followed or documentation is provided when procedures could not be followed (e.g. field equipment failures); and
- Written assurances that those individuals responsible for sampling and data analysis have had proper training.

Details of what must be included in a QAP or SAP are included in Credible Data Requirements in Appendix B.

V. Monitoring Site Information

Before water quality data can be entered, monitoring sites must be established in ADEQ's database. When a site is established, the database generates a unique site identification number (ADEQ Number) which becomes the primary link to the monitoring data entered in the database.

Only the following nominal amount of information is required from the monitoring entity to establish a site:

- Surface water name (e.g., Sycamore Creek);
- Descriptive site name (e.g., Below Celsius Mine Road);
- Monitoring entity's site code (e.g., SYC001); and
- Latitude and longitude, indicating the method used to determine the latitude and longitude and whether they are in degrees-minutes-seconds or decimal degrees (e.g., 324532 / 110 2020; dms)

The following additional information should be provided <u>if known</u>, as ADEQ will be adding this information when it establishes the site:

- Flow regime (is the water primarily perennial, intermittent, or ephemeral);
- Potential sources of water quality impairments, including natural background conditions;
- HUC (Hydrologic Unit Code);
- Reach or lake number;
- Elevation (feet above mean sea level), indicating the method used to determine the elevation;
- Drainage area (square miles), indicating the method used to determine the drainage area;
- County;
- Trophic status (if a lake);
- Access (description of how to get to the site);
- US Geological Survey's topographic quadrangle map (7.5 minute scale) where the site can be found; and
- Other comments concerning ambient conditions noted by the field staff (e.g., precipitation event, activities in the stream).

Of this optional information, the first two are the most important as they cannot be reliably determined from GIS coverages or other references. It is important to permanently track conditions noted by field staff and link these conditions to the water quality data being submitted. (Note that "sampling event descriptions" of changing field conditions when samples where collected are documented as part of the data submittal discussed in the next section.)

Please indicate if data has been entered previously for any of the sites so that a duplicate site is not generated.

VI. Water Quality Data Submittal

Submittals must be ASCII fixed-width format, with all fields left justified. (Don't panic if you are not yet familiar with this format, most database programs can download your data to this format. After reading this document, including the Question and Answer section, contact the Data Submittal Coordinator with other questions about how to transfer your data into this format.)

General formatting guidance

- If a field is not applicable, leave the field blank (null value). However, some fields are mandatory.
- Submittals may be in upper or lower case or combination. ADEQ will automatically convert all text to caps.
- Include duplicate and split samples in the data (indicate Lab Sample Type D or S – see Appendix I)
- Do not include data from blanks or laboratory surrogate spikes.
- Do not export header row with the data.

Field-specific guidance

The following table provides a concise description of the fixed-width format being requested for surface water data submittal. To provide consistency and minimize data entry, most fields have a predefined list of entries (Look-up Tables). If you cannot find the entry you need, contact ADEQ's Data Submittal Coordinator so that the list can be updated.

Surface Water Data ASCII Fixed-Width Format

Field Name	Field Length	Position	Look-up Table	Requirements and Comments
ADEQ Number	6	01 – 06		Unique number created by ADEQ's database when the site is established.
Lab Name *	5	07 – 11	Lab List	Laboratory conducting the analysis. (Appendix F)
Reporting Agency	5	12 – 16	Agency List	Monitoring Entity submitting the data. (Appendix D)
Collecting Agency	5	17 – 21	Agency List	Monitoring Entity that collected the data. (Appendix D)
Sample ID	60	22 – 81		Monitoring entity's sample identification. (See also Lab ID and Site ID requested.)
Field Sample Type	1	82	Sample Types	Type of sample collected (e.g., grab) (Appendix I)
Lab Sample Type	1	83		(Appendix I)
Lab ID *	15	84 – 98		Sample identifier assigned by the lab.
Sample Date	10	99 – 108		mm/dd/yyyy – Date collected.
Sample Time	4	109 – 112		Military format (e.g., 1330) – Time sample was collected.
Sample Depth	7	113 – 119		Depth sample was collected (lake samples) (if applicable)
Method *	20	120 – 139	Accepted Lab Methods	Analysis method. (Appendix C)
STORET	5	140 – 144	STORET Codes	Include the leading zeros in the STORET code (treat as text). The STORET code describes the parameter, the media, analysis type, and units. (Appendix K)
Lab Reporting Limit*	8	145 – 152		Lab reporting limit of the analyte. (See definitions in the Appendix A.)
Lab Reporting Limit Unit*	8	153 – 160	Measuring Unit	Unit of measurement used for the Lab Reporting Limit. (Appendix H)

Field Name	Field Length	Position	Look-up Table	Requirements and Comments
Sample Result	12	161 – 172		Numeric sample result. (**See explanation below about coordinating Sample Result and Lab Notations.)
Lab Notation*	3	173 – 175	Lab Notation	Lab notation for Sample Result. (Appendix G) (**See explanation below about coordinating Sample Result and Lab Notations.)
Sample Result Unit	8	176 – 183	Measuring Unit	(Appendix H)
Dilution*	10	184 – 193		Dilution factor for the analysis (if applicable). **If no dilution was applied, enter a "1".** The dilution factor field can accept real numbers including numbers less than 1.
Lab Qualifier 1*	3	194 – 196	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 2*	3	197 – 199	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 3*	3	200 – 202	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 4*	3	203 – 205	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 5*	3	206 – 208	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 6*	3	209 – 211	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 7*	3	212 – 214	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 8*	3	215 – 217	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 9*	3	218 – 220	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Lab Qualifier 10*	3	221 – 223	Lab Data Qualifiers	ADHS lab data qualifiers. (Appendix E)
Sampler Name	60	224 – 283		Person who collected the sample.
Site ID	12	284 – 295		Permanent site ID used by monitoring entity.
Comments	500	296 – 795	Sampling Event Description	VERY IMPORTANT. Use codes in Appendix J, then add more narrative as needed to discuss: A. Field and equipment conditions when sample was collected, B. Data validity issues beyond the lab notations and lab data qualifiers already noted (e.g., variation among splits and duplicates). Separate comment codes or narrative comments with "$" rather than commas or semicolons.

Table notes:

- Starred fields (*) are required when the sample result is determined in a laboratory. These fields are not required for field conditions or for a Colilert sample.

- Be sure that the STORET field shows the full STORET Code including the leading zeros (e.g., 09145 or 00012). The STORET codes must be accurate, as they are used to identify the parameter, fraction analyzed, media, and units of measurement (e.g. copper, dissolved, water, µg/L).

- Lab Notation, Sample Result, and Sample Result Unit fields are related as follows:

    A. If Lab Notation is "LT" (less than) or "ND" (not detected), the Sample Result field and the Sample Result Unit field are null (blank);
    B. If Lab Notation is "TR" (trace) or "0" (analysis lost or not performed), the Sample Result field and Sample Result Unit field are null (blank);
    C. For all other Lab Notation codes, the Sample Result field and Sample Result Unit field must be filled in.

VII. Questions and Answers

Q: Our office uses Microsoft Access. How do I create an ASCII fixed width text file?

A: Complete the following steps in the database window:

- Click the name of the table or query to export, and then in the **File** menu, click **Save As/Export**.
- In the **Save As** dialog box, click **To an External File Or Database**, and then click **OK**.
- In the **Save as Type** box, click **Text Files**.
- Click the arrow to the right of the **Save In** box and select the drive or folder to export to.
- In the **File Name** box, enter the file name, and then click **Export**.
- The Microsoft Access then starts the Export Text Wizard.

  If you saved a specification when exporting this table or query previously and want to load it, click **Advanced,** then click **Specs**, and finally double-click the specification. Note: at anytime before clicking **Finish,** you can click the advanced button to specify the text format to save as (Windows [ANSI] or DOS OS/2 [PC-8]); date, time, and number formats; and which columns to export.
- Choose to create a fixed-width file, and then click **Next.**
- Follow the directions in the remaining dialog boxes.

  Note: When the wizard is finished, it automatically saves a specification of the choices you made to the default name: *Filename*_ExportSpec. To specify the name yourself, click **Advanced**, click **Specs**, and then click **Save As**. You can load this specification next time you export data from the same table or query so you don't have to repeat the choices in the Export Text Wizard.

Q: What if I find later that we have submitted incorrect information?

A: Simply contact the Data Submittal Coordinator and provide the corrected information. Be sure to include other pertinent information, such as ADEQ number or Site ID, sample date and time.

Q: Is there any case sensitivity in ADEQ's Water Quality Database?

A: Code in the database will set everything to upper case. You can submit in either upper or lower case.

Q: Do I need to include the leading zeros in the STORET Code field?

A: Yes, the leading zeros are very important. For example, a STORET code "00010" must not be submitted as "10" because the database will not recognize the code. The STORET code field should be treated as a text field, rather than a number field.

Q: Do header rows need to be exported with the dataset?

A: No, they do not. By following the fixed-width format, ADEQ knows what to expect with each column.

Q: Do I include data from trip blanks, field blanks, or equipment rinsate blanks or surrogates?

A: No, if a sample is not directly associated with a surface water, we cannot accept it.

Q: Do I include data collected from a spring or ephemeral wash?

A: Yes, ADEQ wants data associated with all natural waters and waterways in the state, including springs as well as data associated with canals and recreational lakes. Arizona's Water Quality

Standards for Surface Waters (Arizona Administrative Code R18-11-101.43) defines a surface water to include:

> A lake, reservoir, natural pond, river, stream (including an intermittent or ephemeral stream), creek, wash draw, mudflat, sandflat, wetland, slough, backwater, prairie pothole, wet meadow, playa lake. This includes an impoundment of such waters or a tributary to such waters.

ADEQ is interested in tracking water quality data from springs, as a ground water source of water for surface waters. Spring monitoring data will actually be tracked in the ground database, so that data should be submitted separate from the surface water data.

Although not natural surface waters, many of the canals in the Phoenix and Yuma areas are specifically provided with designated uses and surface water quality standards; therefore, ADEQ is interested in obtaining all readily available water quality data for these waterways.

Although not included in the surface water definition, ADEQ is interested in tracking water quality data for "urban lakes" or man-made lakes created for recreational purposes.

Q: What surface water data should not be included?

A: Surface water samples collected from impoundments associated with waste treatment (e.g., sewage treatment or mining associated ponds) should not be submitted. These water are specifically exempted from ambient surface water standards (A.A.C. R18-11-102.B).

Also, surface water samples collected outside of a waterway or impoundments (for example in a constructed roadside ditch or on mining tailings pile), and not associated with a natural spring should not be submitted.

Please contact the Data Submittal Coordinator if you have questions about which sampling data should or should not be submitted.

Q: I have more data to add to a site now. Should I resubmit all of the data? How can I learn what data has already been submitted?

A: To avoid duplication of records, do not resubmit the entire dataset. Submit only the new data. Identification and exclusion of duplicate records when it is received by ADEQ is very time consuming. If unsure what data has already been submitted, please contact the Data Submittal Coordinator.

Q: Do I include field measured water quality parameters (i.e., pH, flow, sample depth, turbidity)?

A: Yes, this data is very important. Use the sample type code "F" and the appropriate STORET codes for the parameters.

It is also very important to include field notes about equipment problems and other event conditions (e.g., floods, drought) in the "Comment" field. If this type of information is not already in your database, please contact the Data Submittal Coordinator to work out a way to capture this information.

Q: What "Sample Type" codes must be used for field analysis?

A: A table of Sample Type codes is provided in Appendix I, along with a short definition for each. Generally field parameters are included in code "F."

Q: What media should I submit data in?

A: CD, floppy disk or electronic (e-mail) transmittals are all acceptable.

Q: How often should I submit data?

A: The data submittal frequency will be worked out on a case-by-case basis. If possible, ADEQ would like to work out submittals twice a year to support assessments that are completed yearly.

Q: What if there is not a look-up code for something that I need (e.g., my agency, STORET)?

A: Send an e-mail to the Data Submittal Coordinator, giving a detailed description of what needs to be added. ADEQ will make the needed additions to the tables and will e-mail back an appropriate look-up code.

Q: If a consultant is working for a client, how does this influence the "Collecting Agency" and "Reporting Agency" codes reported?

A: In general, the consultant company is the Collecting Agency and the client is the Reporting Agency. If either is not already on the Agency List, please contact the Data Submittal Coordinator and the appropriate changes will be made to the list.

Q: What if my laboratory method of analysis does not appear in the "Acceptable Laboratory Methods" list?

A: Send an e-mail to the Data Submittal Coordinator giving the method, description of the method, and laboratory contact information. ADEQ will research it, add the laboratory method if appropriate, and inform you by e-mail of the outcome.

Q: How do we indicate our data validation concerns? Do our codes supersede those from the laboratory in the "Lab Notation" field?

A: No, the Lab Notation and Lab Data Qualifier fields are reserved for how the data is reported to you from the lab. Your data validation comments should be added to the "comment" field.

Q: Must there be an entry for the "Analysis Data" field for a field sample?

A: Yes, you may enter the sample date or the date the sample result was obtained if there is a time lag before sample results are available.

Q: Can the "Sample Result" be null (left blank)?

A: Yes, if the Lab Notation code is TR, O, and ND, the Sample Result field can be left blank. All other Lab Notations require the Sample Result field have a value.

Q: Is the "Extraction Date" required?

A: Yes. If your laboratory did not include an extraction date, please contact the laboratory and the Data Submittal Coordinator. In the event that an extraction date is not available, this needs to be reported in the cover letter for the data submittal.

Q: If the laboratory reports a "Tentatively Identified Compound" (TIC), is a STORET number required?

A: Yes, the lab must associate the value being reported with some compound and the appropriate STORET number for the data to be loaded into the database. An appropriate code from the "Lab Data Qualifiers" list should be used to indicate that the identity of the compound is uncertain.

Q: What if the units in "STORET Code" table do not match the units of my Sample Result?

A: It is best to use the STORET Code where the analyte and the units both match. However, "Sample Result Unit" will indicate the unit you are reporting in. Therefore, if is acceptable to use the STORET code for the analyte even thought the units do not match. Please indicate this mismatch in the cover letter included in your submittal.

Q: If there any justification I should use?

A: ASCII fixed-width format automatically left justifies all fields.

Q: In the "Lab Reporting Limit" field, should I be reporting the MDL, the PQL, or the MRL?

A: These abbreviations and definitions can be tricky. Based on recent definitions provided by the Arizona Department of Health Services, the MRL (Minimum Reporting Level) or PQL (Practical Quantification Level) should be reported. These analogous terms describe the laboratory reported value that is the lowest reproducible concentration level included on the calibration curve from the analysis of a pollutant and that can be quantified in terms of precision and accuracy.

Do not report the MDL (Minimum Detection Limit or Method Detection Limit) as these are statistically derived values, as they provide a gauge to assess method, instrument, and analyst performance but not typically quantification with high certainty for reporting purposes. This value may not be within the calibration range of the instrument used.