APPENDIX B: WATER QUALITY DATA ELEMENTS FOR TOXICOLOGICAL ANALYTES

Water Quality Data Elements for Reporting Results of Toxicity Test Analyses
January 22, 2004 Version 2.5

Data Element	Definition
1.0 Contact Elements Module	**See Chemical/Microbiology Data Elements**
2.0 Result Module	
2.1 Result Value	
2.1.1 Result or Endpoint Value	Reportable numerical measure of the result for the biological organism, or other characteristic, being analyzed: e.g., LC50, NOEC
2.1.2 Unit of Measure	The name of the determinate quantity for a standard of measurement used for measuring dimension, capacity, or amount of something. e.g. count
2.1.3 Biological Response*	Type of organism response measured in the test: e.g., survival, reproduction, growth (e.g., dry weight), fertilization.
2.1.4 Result Type*	The statistically-derived endpoint that was calculated to express the test result in 2.1.1: e.g., NOEC, LOEC, LC_{50}, IC_{25}.
2.1.5 Confidence Intervals**	The values representing the lowest and highest confidence level
2.1.6 Confidence Level**	The percent confidence associated with the confidence levels; i.e., 95%, 99%
2.1.7 Method of Comparison**	The basis for comparison that yielded the sample result or endpoint. For example, compared to laboratory control, reference sample, upstream sample.
2.1.8 Statistical Analysis Used**	Statistical test(s) used to obtain result or endpoint value (e.g., t-test, Dunnett t, ANOVA, Probit)
2.1.9 Mean organism survival per replicate and treatment*	Table with mean survival values for each replicate and treatment in the test to which the result value applies. Note, if the response reported is survival, this element not necessary
2.1.10 Range of physicochemical parameters per replicate and treatment*	Table with numeric ranges of water quality parameters measured during the test in either replicates or treatments to which the result value (element 2.1.1) applies. Examples of parameters include dissolved oxygen, pH, temperature, salinity or conductivity.
2.2 Species Tested	
2.2.1 Analyte (Species) Name	The name assigned to a substance or feature that describes it in terms of its molecular composition, taxonomic nomenclature or other

Data Element	Definition
	characteristic.
2.2.2 Analyte (Species) Code	The unique identification number assigned by either the Integrated Taxonomic Information System, (ITIS) the International Committee on Taxonomy of Viruses, or the EPA Biological Registry System .
2.2.3 Taxonomic Identification Reference**	Text indicating taxonomic reference or source used to verify test species identity.
2.2.4 Test Organism Age*	Age of organisms at test initiation in either hours or days
2.2.5 Units of Organism Age*	Hours or days
3.0 Reason for Sampling Module	
3.1 Reason for Sample Collection	A text field e.g., Reconnaissance/Occurrence Survey, Permit Compliance, Pollution Event, Storm Event, Research
3.2 Sampling Design Used	Type of sampling design used to choose sites for sample collection. Includes: probabilistic, stratified-random, targeted, systematic
3.3 Data and/or Measurement Quality Objectives**	Brief summary of MQOs in relation to toxicity sampling and testing; for example, test precision, RSD ≤ 20%.
4.0 Date/Time Module	**See Chemical/Microbiology Data Elements**
5.0 Sample Location Module	**See Chemical/Microbiology Data Elements**
6.0 Sample Collection Module	
6.1 Sample Type	The type of sample being described e.g., Routine Sample, Field Replicate, Reference sample
6.2 Media Sampled	The environmental media sampled at a site. The environmental material about which results are reported from either direct observation or collected samples e.g., surface water, sediment, wastewater
6.3 Sample Collection Temperature	Temperature of the sample when collected
6.4 Sample Identification	The unique name, number, or code assigned to identify the sample.
6.5 Sample Collection Method	
6.5.1 Area or Volume Sampled**	Amount of area or volume of material sampled for toxicity testing. For example, 1 square meter of stream bottom was sampled or 2 liters of sediment were collected for testing.
6.5.2 Written Sampling Method Citation**	Reference citation (preferably published) for sampling method used.
6.5.3 Certification/Training Status Of Sampler Personnel**	Text providing any certification or experience level of personnel sampling. For example, agency-trained/certified personnel.
6.5.4 Sample Composite Method**	Method used to composite subsamples, if any

Data Element	Definition
6.5.5 Elapsed Time From Sample Collection To Delivery To Lab*	Time in hours between the end of sample collection and the receipt of the sample at the lab
6.6 Sample Preservation/Processing	
6.6.1 Container type	Free text: Sample container type
6.6.2 Container color	Free text: Sample container color
6.6.3 Container size	The container size used in sample collection
6.6.4 Sample collection filtering code	Filtered, unfiltered, or the specific fraction
6.6.5 Sample collection filtering comment text	Free text describing any comments
6.6.6 Chemical preservation method	The method used to preserve the sample in the field by the sampling entity. This entry is intended to include preservation techniques that are NOT specified as part of the *Analytical Method,* element 7.5
6.6.7 Chemical preservation method comment	Free text describing any comments
6.6.8 Temperature Preservation Method	The method used to preserve the sample in the field by the sampling entity. This entry is intended to include preservation techniques that are NOT specified as part of the *Analytical Method,* element 7.5
6.6.9 Chemical manipulation of the sample*	Text indicating chemical modification of the sample prior to testing, if any; e.g., pH adjustment, dechlorination.
6.6.10 Field Or Lab Processing**	Indicate whether samples were processed in the field or lab
6.6.11 Initial Device Used**	Indicate equipment used for initial processing such as screens, sieves, splitters.
6.6.12 Subsampling Method**	Text indicating method used to obtain subsamples for testing, if any: random aliquot
6.6.13 Homogenization Method**	Text indicating how sample was mixed prior to testing, if any: shaker, manual stirring,?
6.6.14 Compositing Method**	Text indicating the way in which samples were composited during processing, if any.
6.6.15 Written Protocol Citation**	Citation for method used in sample processing.
6.6.16 Sample Storage Time**	Time, in hours or days, over which sample was stored prior to testing hours or days.
6.7 Sample Volume	See Chemical/Microbiology Data Elements
6.8 Sample Weight Collected	See Chemical/Microbiology Data Elements
7.0 Sample Analysis and QC Module	
7.1 Extraction/processing Date	N/A - See Chemical/Microbiology Data Elements
7.2 Extraction/processing Time	N/A - See Chemical/Microbiology Data Elements

Data Element	Definition
7.3 Analysis (Test) Date (inclusive beginning and end dates)	The calendar date when analysis of the analyte was finished, reported as 4-digit year, 2-digit month, and 2-digit day in YYYYMMDD format.
7.3.1 Test Duration*	Time over which test performed
7.4 Analysis (Test) Time	At test initiation; See Chemical/Microbiology Data Elements
7.5 Method Number	The method number of the analytical method used, represented as a reference number: (a) EPA (Specify number) (b) ASTM (Specify number) (c) SM (Specify number) (d) Other methods as applicable
7.5.1 Modifications to method if any*	Text indicating any departures from the referenced method such as test temperature, sample holding time, or organism age
7.5.2 Organism feeding regime*	Text specifying type and rate of feeding and whether organisms were fed as per cited protocol
7.5.3 Test chamber material*	Text indicating type of material with which test chambers made: HDPE plastic, stainless steel, Teflon, glass, etc.
7.5.4 Chamber volume*	Number of mls of solution or sediment/soil that the test chamber can hold
7.5.5 Number of replicates*	Number of separate replicates tested for each test concentration or sample
7.5.6 Organisms per replicate*	Number of test organisms exposed to material in each test chamber
7.5.7 Mean response per replicate and treatment*	Table with numeric values of the mean response (as defined in element 2.1.3) for each replicate and treatment in the test to which the result value (element 2.1.1) applies.
7.5.8 Test Temperature*	Target temperature value and acceptable range
7.6 Sample Size	The size of the sample used for analysis
7.7 Serial Dilution*	Percentages of sample tested: e.g., 0, 10, 20, 50, 100% sample
7.8 Composite Sample	(a) Time, Flow, or (c) Spatial flow-weighted, proportional, cross-sectional, or integrated depth, or (d) Other entries as applicable
7.9 Run Batch	N/A - See Chemical/Microbiology Data Elements
7.10 (Spiking) amount or dose added	The amount (weight or volume) or final concentration of an analyte that has been spiked into an aliquot at any time during the

Data Element	Definition
	analysis process.
7.11 Analytical (Test) Precision	
7.11.1 Control Precision	A measure of the agreement among individual measurements of the same property in duplicate laboratory samples (or duplicate laboratory spiked samples) under prescribed similar conditions to estimate variability in the measurement method or procedures. Precision is expressed as: (a) standard Deviation, (b) % Relative Standard Deviation (RSD), (c) Relative Percent Difference (RPD), (d) coefficient of variation (C.V.)
7.11.2 Intra-test Precision*	Measure of test precision or statistical sensitivity (e.g., Minimum Significant Difference [MSD] or percent MSD [PMSD])
7.12 Analytical Accuracy/Error	N/A - See Chemical/Microbiology Data Elements
7.13 Bias Number	N/A - See Chemical/Microbiology Data Elements
7.14 Control and Reference Sample Information*	
7.14.1 Positive Control Name*	Analyte used as positive control in test
7.14.2 Positive Control Result*	The analytical result of measuring the positive control: Presence or Absence of negative control
7.14.3 Negative Control Name (Dilution Water or Control Sediment or Soil Used)*	Text indicating type of water or sediment used for test dilutions and as a negative control (e.g., tap water vs. RO water vs surface water and salinity, hardness, and/or organic carbon content)
7.14.4 Negative Control Result*	The analytical result of measuring the negative control: Presence or absence of control
7.14.5 Reference Sample Name*	Text indicating name (location) of water, soil, or sediment used as a reference measure for test, if any
7.14.6 Reference Sample Result*	Numeric entry indicating response of reference sample results, if any, associated with result or endpoint; e.g., upstream water survival = 100%
7.15 Detection/Quantitation Level	
7.15.1 Detection/Quantitation level measure	N/A - See Chemical/Microbiology Data Elements
7.15.2 Detection/Quantitation	N/A - See Chemical/Microbiology Data Elements
7.16 Detection/Quantitation Level Type	N/A

Data Element	Definition
7.17 QA/QC Exception Flags (Test Acceptability Criteria Met?)	Flags should allow for: Analyzed past holding time - Dual quantification difference> 40% RPD - Estimated value, quantification doesn't meet SOP criteria - Duplicate injection precision not met - Spike recovery outside of control limits - Spike out of calibration range
7.18 QA/QC Exception Comment (Test Acceptability Notes)	Text indicating any comments or clarifications concerning how the test met or didn't meet certain acceptability criteria
7.19 QA/QC Comment Field	
7.19.1 Potential Interferences Observed in Test*	Text indicating potential sources of interference observed by analysts such as low dissolved oxygen, high turbidity, presence of predators.
7.20 Reference Toxicant Results*	
7.20.1 Reference Toxicant Name*	Text indicating material used in reference toxicant testing
7.20.2 Reference Toxicant Results*	Endpoint or result for corresponding >reference toxicant test
7.20.3 Date of reference toxicant test*	Date when associated reference toxicant test was initiated.
7.20.4 Control Chart Limits*	95% C.I. for endpoint or result value given in 7.20.2
7.21 Laboratory Certifications/ Accreditation**	List applicable certifications or accreditations for the type of testing reported.

Elements marked with * denote ones that are unique to toxicological data. Elements marked with ** denote ones that are shared between toxicological and population-community data