Table A7.1a - Field Measurement Performance Specifications for Routine Systematic and Biased Flow Monitoring Events

PARAMETER	UNITS	MATRIX	METHOD	PARA-METER CODE	AWRL	LOQ	LOQ CHECK STD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (%Rec. of LCS)	Lab
Temperature	ºC	water	SM 2550 and TCEQ SOP, V1	00010	NA[1]	NA	NA	NA	NA	Field
Specific Conductance	µS/cm	water	EPA 1201 and TCEQ SOP, V1	00094	NA[1]	NA	NA	NA	NA	Field
pH	standard units	water	EPA 150.1 and TCEQ SOP, V1	00400	NA[1]	NA	NA	NA	NA	Field
DO	mg/L	water	SM 4500-O G. and TCEQ SOP, V1	00300	NA[1]	NA	NA	NA	NA	Field
Depth of Bottom of water body at sample site	meters	water	TCEQ SOP, V2	82903	NA[1]	NA	NA	NA	NA	Field
Transparency, Secchi Disc	meters	water	TCEQ SOP, V1	00078	NA[1]	NA	NA	NA	NA	Field
Days since precipitation event	days	other	TCEQ SOP V1	72053	NA[1]	NA	NA	NA	NA	Field
Flow Stream, Instantaneous	cfs	water	TCEQ SOP, V1	00061	NA[1]	NA	NA	NA	NA	Field
Flow method	1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler	water	TCEQ SOP, V1	89835	NA[1]	NA	NA	NA	NA	Field
Flow severity	1-no flow 2-low 3-normal 4-flood 5-high 6-dry	water	TCEQ SOP, V1	01351	NA[1]	NA	NA	NA	NA	Field
Stream Flow Estimate (CFS)	cfs	water	TCEQ SOP, V1	74069	NA[1]	NA	NA	NA	NA	Field
Maximum pool width at time of study[2]	meters	other	TCEQ SOP V2	89864	NA[1]	NA	NA	NA	NA	Field
Maximum pool depth at time of study[2]	meters	other	TCEQ SOP V2	89865	NA[1]	NA	NA	NA	NA	Field
Pool length[2]	meters	other	TCEQ SOP V2	89869	NA[1]	NA	NA	NA	NA	Field
% pool coverage in 500 meter reach[2]	%	other	TCEQ WOP V2	89870	NA[1]	NA	NA	NA	NA	Field
Wind Intensity (1=calm, 2=slight,3=mod, 4=strong)	NU	other	NA	89965	NA	NA	NA	NA	NA	Field
Present Weather (1=clear,2=ptcldy, 3=cldy,4=rain, 5=other)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field
Water Surface (1= calm,2=ripple,3=wave,4=whitecap)	NU	water	NA	89968	NA	NA	NA	NA	NA	Field
Water Color (1=brownish, 2=reddish,3=greenish,4=blackish, 5=clear,6=other)	NU	water	NA	89969	NA	NA	NA	NA	NA	Field
Water Odor (1=sewage,2=oily/ chemical,3=rotten egg,4=musky, 5=fishy,6=none, 7=other)	NU	water	NA	89971	NA	NA	NA	NA	NA	Field

PARAMETER	UNITS	MATRIX	METHOD	PARA-METER CODE	AWRL	LOQ	LOQ CHECK STD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (%Rec. of LCS)	Lab
Water clarity (1=excellent,2=good,3=fair,4=poor)	NU	water	NA	20424	NA	NA	NA	NA	NA	Field
Turbidity, observed (1=low,2=medium, 3=high)	NU	water	NA	88842	NA	NA	NA	NA	NA	Field
Primary contact, observed activity (# of people observed)	# of people observed	other	NA	89978	NA	NA	NA	NA	NA	Field
Evidence of primary contact recreation (1=observed, 0=not observed)	NU	other	NA	89979	NA	NA	NA	NA	NA	Field

1 Reporting to be consistent with SWQM guidance and based on measurement capability.
2 Parameters for pools to be reported only if pooled conditions are sampled as outlined under the TCEQ Interim Guidance for Routine Surface Water Quality Monitoring During Extended Drought.

References for Table A7.1a:

- United States Environmental Protection Agency (USEPA) "Methods for Chemical Analysis of Water and Wastes," Manual #EPA-600/4-79-020
- American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), "Standard Methods for the Examination of Water and Wastewater," 20th Edition, (or most recent version)
- TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures Manual, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, August 2012 or most recent editions (RG-415)

Table A7.1b - Measurement Performance Specifications for Routine Systematic Monitoring Events Collected Three times over 10 Months.

PARAMETER	UNITS	MATRIX	METHOD	PARA-METER CODE	AWRL	LOQ	LOQ CHECK STD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (%Rec. of LCS)	Lab
Residue, Total nonfiltrable (TSS)	mg/L	water	SM 2540 - D	00530	4	1	NA	NA	NA	Eastex
Chloride (mg//L as CL)	mg/L	water	SM 4500 Cl- C	00940	5	5	70-130	20	80-120	Eastex
Sulfate (mg/L as SO4)	mg/L	water	ASTM D516	00945	5	5	70-130	20	80-120	Eastex
Turbidity, Lab Nephelometric Turbidity Units	NTU	water	SM 2130B	82079	0.5	0.5	NA	NA	NA	Eastex
Nitrogen, Ammonia, Total (mg/L as N)	mg/L	Water	SM4500 NH3-G	00610	0.1	0.1	70-130	20	80-120	Eastex
Nitrogen, Kjeldahl, Total (mg/L as N)	mg/L	water	SM 4500 – Norg C and SM4500-NH_3 B	00625	0.2	0.2	70-130	20	80-120	Eastex
Nitrite+Nitrate, total one lab determined value (mg/L as N)	mg/L	water	SM 4500 – NO_3 F	00630	0.05	0.02	70-130	20	80-120	Eastex
Phosphorus, Total, Wet Method (mg/L as P)	mg/L	water	SM 4500-P E	00665	0.06	0.02	70-130	20	80-120	Eastex
Orthophosphate phosphorus, diss, mg/L, Field Filtered <15 min	mg/L	water	SM 4500-P E	00671	0.04	0.02	70-130	20	80-120	Eastex
Orthophosphate phosphorus, diss, mg/L, Filtered >15 min	mg/L	water	SM 4500-P E	70507	0.04	0.02	70-130	20	80-120	Eastex
Chlorophyll-a,	µg/L	water	EPA 446.0	32211	3	3	NA	20	80-120	Eastex

PARAMETER	UNITS	MATRIX	METHOD	PARA-METER CODE	AWRL	LOQ	LOQ CHECK STD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (%Rec. of LCS)	Lab
spectrophotometric acid method										
Pheophytin, spectrophotometric acid method	µg/L	water	EPA 446.0	32218	3	3	NA	NA	NA	Eastex
E. coli, , Colilert, IDEXX method MPN/mL	MPN/100 mL	water	Colilert-18[4]	31699	1	1	NA	0.5[3]	NA	Eastex
E. coli, Colilert, IDEXX, holding time	hours	other	NA	31704	NA	NA	NA	NA	NA	Eastex

3 This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the sample result and the logarithm of the duplicate result. See Section B5.

4 *E.coli* samples analyzed by IDEXX Colilert-18 should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

References for Table A7.1b:

- United States Environmental Protection Agency (USEPA) "Methods for Chemical Analysis of Water and Wastes," Manual #EPA-600/4-79-020
- American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), "Standard Methods for the Examination of Water and Wastewater," 20th Edition or most recent version
- TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures Manual, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, August 2012 or most recent editions (RG-415)

Table A7.1c - Measurement Performance Specifications for Routine Systematic Monitoring Events Collected Seven Times Over 10 Months.

PARAMETER	UNITS	MATRIX	METHOD	PARA-METER CODE	AWRL	LOQ	LOQ CHECK STD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (%Rec. of LCS)	Lab
Residue, Total nonfiltrable (TSS)	mg/L	water	SM 2540 - D	00530	4	1	NA	NA	NA	Eastex
Nitrogen, Ammonia, Total (mg/L as N)	mg/L	Water	SM4500 NH3-G	00610	0.1	0.1	70-130	20	80-120	Eastex
Nitrogen, Kjeldahl, Total (mg/L as N)	mg/L	water	SM 4500 – Norg C and SM4500-NH_3 B	00625	0.2	0.2	70-130	20	80-120	Eastex
Nitrite+Nitrate, total one lab determined value (mg/L as N)	mg/L	water	SM 4500 – NO_3 F	00630	0.05	0.02	70-130	20	80-120	Eastex
Phosphorus, Total, Wet Method (mg/L as P)	mg/L	water	SM 4500-P E	00665	0.06	0.02	70-130	20	80-120	Eastex
Orthophosphate phosphorus, diss, mg/L, Field Filtered <15 min	mg/L	water	SM 4500-P E	00671	0.04	0.02	70-130	20	80-120	Eastex
Orthophosphate phosphorus, diss, mg/L, Filtered >15 min	mg/L	water	SM 4500-P E	70507	0.04	0.02	70-130	20	80-120	Eastex
Chlorophyll-a, spectrophotometric acid method	µg/L	water	EPA 446.0	32211	3	3	NA	NA	NA	Eastex
Pheophytin, spectrophotometric acid method	µg/L	water	EPA 446.0	32218	3	3	NA	NA	NA	Eastex
E. coli, , Colilert, IDEXX method MPN/mL	MPN/100 mL	water	Colilert-18[6]	31699	1	1	NA	0.5[5]	NA	Eastex
E. coli, Colilert, IDEXX, holding time	hours	other	NA	31704	NA	NA	NA	NA	NA	Eastex

5 This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the sample result and the logarithm of the duplicate result. See Section B5.

6 *E.coli* samples analyzed by IDEXX Colilert-18 should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

References for Table A7.1c:

- United States Environmental Protection Agency (USEPA) "Methods for Chemical Analysis of Water and Wastes," Manual #EPA-600/4-79-020
- American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), "Standard Methods for the Examination of Water and Wastewater," 20th Online Edition,(or most recent version)
- TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures Manual, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, August 2012 most recent editions (RG-415)

Table A7.1d - Measurement Performance Specifications for Biased Flow Monitoring Events (Up to three events during 10 month period.)

PARAMETER	UNITS	MATRIX	METHOD	PARA-METER CODE	AWRL	LOQ	LOQ CHECK STD %Rec	PRECISION (RPD of LCS/LCS dup)	BIAS (%Rec. of LCS)	Lab
Residue, Total nonfiltrable (TSS)	mg/L	water	SM 2540 - D	00530	4	1	NA	NA	NA	Eastex
Nitrogen, Ammonia, Total (mg/L as N)	mg/L	Water	SM4500 NH3-G	00610	0.1	0.1	70-130	20	80-120	Eastex
Nitrogen, Kjeldahl, Total (mg/L as N)	mg/L	water	SM 4500 – Norg C and SM4500-NH_3 B	00625	0.2	0.2	70-130	20	80-120	Eastex
Nitrite+Nitrate, total one lab determined value (mg/L as N)	mg/L	water	SM 4500 – NO_3 F	00630	0.05	0.02	70-130	20	80-120	Eastex
Phosphorus, Total, Wet Method (mg/L as P)	mg/L	water	SM 4500-P E	00665	0.06	0.02	70-130	20	80-120	Eastex
Orthophosphate phosphorus, diss, mg/L, Field Filtered <15 min	mg/L	water	SM 4500-P E	00671	0.04	0.02	70-130	20	80-120	Eastex
Orthophosphate phosphorus, diss, mg/L, Filtered >15 min	mg/L	water	SM 4500-P E	70507	0.04	0.02	70-130	20	80-120	Eastex
E. coli, , Colilert, IDEXX method MPN/mL	MPN/100 mL	water	Colilert-18[8]	31699	1	1	NA	0.5[7]	NA	Eastex
E. coli, Colilert, IDEXX, holding time	hours	other	NA	31704	NA	NA	NA	NA	NA	Eastex