**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 | NA1 | NA | NA | NA | NA | Field |
| Specific Conductance | µS/cm | water | EPA 1201 and  TCEQ SOP, V1 | 00094 | NA1 | NA | NA | NA | NA | Field |
| pH | standard units | water | EPA 150.1 and TCEQ SOP, V1 | 00400 | NA1 | NA | NA | NA | NA | Field |
| DO | mg/L | water | SM 4500-O G. and  TCEQ SOP, V1 | 00300 | NA1 | NA | NA | NA | NA | Field |
| Depth of Bottom of water body at sample site | meters | water | TCEQ SOP, V2 | 82903 | NA1 | NA | NA | NA | NA | Field |
| Transparency, Secchi Disc | meters | water | TCEQ SOP, V1 | 00078 | NA1 | NA | NA | NA | NA | Field |
| Days since precipitation event | days | other | TCEQ SOP V1 | 72053 | NA1 | NA | NA | NA | NA | Field |
| Flow Stream, Instantaneous | cfs | water | TCEQ SOP, V1 | 00061 | NA1 | NA | NA | NA | NA | Field |
| Flow method | 1-gage  2-electric  3-mechanical  4-weir/flume  5-doppler | water | TCEQ SOP, V1 | 89835 | NA1 | 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 | NA1 | NA | NA | NA | NA | Field |
| Stream Flow Estimate (CFS) | cfs | water | TCEQ SOP, V1 | 74069 | NA1 | NA | NA | NA | NA | Field |
| Maximum pool width at time of study2 | meters | other | TCEQ SOP V2 | 89864 | NA1 | NA | NA | NA | NA | Field |
| Maximum pool depth at time of study2 | meters | other | TCEQ SOP V2 | 89865 | NA1 | NA | NA | NA | NA | Field |
| Pool length2 | meters | other | TCEQ SOP V2 | 89869 | NA1 | NA | NA | NA | NA | Field |
| % pool coverage in 500 meter reach2 | % | other | TCEQ WOP V2 | 89870 | NA1 | 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 |
| 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-NH3 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 – NO3 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 | 20 | 80-120 | 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-184 | | 31699 | 1 | 1 | NA | 0.53 | NA | Eastex |
| *E. coli,* Colilert, IDEXX, holding time | hours | other | | NA | | 31704 | NA | NA | NA | NA | NA | Eastex |

1. 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.
2. *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-NH3 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 – NO3 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-186 | | 31699 | 1 | 1 | NA | 0.55 | NA | Eastex |
| *E. coli,* Colilert, IDEXX, holding time | hours | other | | NA | | 31704 | NA | NA | NA | NA | NA | Eastex |

1. 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.
2. *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-NH3 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 – NO3 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-188 | | 31699 | 1 | 1 | NA | 0.57 | NA | Eastex |
| *E. coli,* Colilert, IDEXX, holding time | hours | other | | NA | | 31704 | NA | NA | NA | NA | NA | Eastex |