# Quality Assurance Project Plan
# Lower Colorado River Authority

## *PO Box 220*
## *Austin, Texas 78767*

## Clean Rivers Program

## Water Quality Planning Division

## Texas Commission on Environmental Quality

## P.O. Box 13087, MC 234

## Austin, Texas 78711-3087

## Effective Period: FY 2020 to FY 2021

**Questions concerning this QAPP should be directed to:**
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# A6 Project/Task Description

The Lower Colorado River Authority will collect water samples from the Colorado River below O.H. Ivie Reservoir to its mouth, as well as all the major tributaries and reservoirs. Parameters collected will include field, flow, bacteria, and conventionals. A total of 57 sites will be routinely monitored. Sampling frequency at 49 locations will be six times per year, in order to maintain a consistent data set, to determine inter-seasonal variability and examine possible pollution impacts. Quarterly monitoring will occur at seven locations. These locations are mostly rural, and have few sources of large impacts on water quality. One location will be monitored semiannually, and has little chance of developing water quality concerns.

The Upper Colorado River Authority will collect water samples at sites in the Concho River and upper Colorado River watersheds, including tributaries and reservoirs. UCRA's monitoring program will include collection of field, E. coli, flow, and conventional parameters. Diel data will be collected at three sites in Segment 1421 which have significant dissolved oxygen issues caused by urban runoff and lack of base flows. Nutrients, chlorophyll *a* and *E. coli* will be collected at select sites throughout the upper basin. Bacteria will not be collected in segment 1412 due to the inability to meet the holding time for *Enterococcus* bacteria. UCRA sampling frequencies vary from quarterly to semiannually, based upon data needs.

City of Austin, an in-kind contributor of CRP data, will collect water samples at routine sites in and around Austin. Field and conventional parameters, flow, sediment and bacteria will be collected, analyzed and reported for Lady Bird and Walter E. Long lakes and several tributaries to the Colorado River. Field measurements are collected at all sites. Organics and metals in sediment will be collected from Lake Walter E. Long, Lake Austin, Lady Bird Lake and Barton Springs. Nutrients and bacteria will be collected at select sites. Chlorophyll *a* will be collected from select sites in Lady Bird Lake and in Lake Walter E. Long. Overall, sampling frequencies vary from once per year to biweekly based on parameter, sites and internal uses for the data.

See Appendix B for the project-related work plan tasks and schedule of deliverables for a description of work defined in this QAPP.

See Appendix B for sampling design and monitoring pertaining to this QAPP.

## Amendments to the QAPP

Revisions to the QAPP may be necessary to address incorrectly documented information or to reflect changes in project organization, tasks, schedules, objectives, and methods. Requests for amendments will be directed from the Lower Colorado River Authority Project Manager to the CRP Project Manager electronically. The Basin Planning Agency will submit a completed QAPP Amendment document, including a justification of the amendment, a table of changes, and all pages, sections, and attachments affected by the amendment. Amendments are effective immediately upon approval by the Lower Colorado River Authority Project Manager, the Lower Colorado River Authority QAO, the CRP Project Manager, the CRP Lead QA Specialist, the TCEQ QA Manager or designee, the CRP Project QA Specialist, and additional parties affected by the amendment. Amendments are not retroactive. No work shall be implemented without an approved QAPP or amendment prior to the start of work. Any activities under this contract that commence prior to the approval of the governing QA document constitute a deficiency and are subject to corrective action as described in section C1 of this QAPP. Any deviation or deficiency from this QAPP which occurs after the execution of this QAPP will be addressed through a Corrective Action Plan (CAP). An Amendment may be a component of a CAP to prevent future recurrence of a deviation.

Amendments will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the Lower Colorado River Authority Project Manager.

## Special Project Appendices

Projects requiring QAPP appendices will be planned in consultation with the Lower Colorado River Authority and the TCEQ Project Manager and TCEQ technical staff. Appendices will be written in an abbreviated format and will reference the Basin QAPP where appropriate. Appendices will be approved by the Lower Colorado River Authority Project Manager, the Lower Colorado River Authority QAO, the Laboratory (as applicable), and the CRP Project Manager, the CRP Project QA Specialist, the CRP Lead QA Specialist and additional parties affected by the Appendix, as appropriate. Copies of approved QAPP appendices will be distributed by the Lower Colorado River Authority to project participants before data collection activities commence. The Lower Colorado River Authority will secure written documentation from each sub-tier project participant (e.g., subcontractors, subparticipants, other units of government) stating the organization's awareness of and commitment to requirements contained in each special project appendix to the QAPP. The Lower Colorado River Authority will maintain this documentation as part of the project's QA records, and ensure that the documentation is available for review.

# Appendix B: Task 3 Work Plan & Sampling Process Design and Monitoring Schedule (Plan)

The actual number of sites, location, frequency, parameters and locations for FY2020 were determined at the FY2020 Coordinated Monitoring Meetings were based on priorities identified at the basin Water Quality Advisory Committee and Coordinated Monitoring meetings**.**

Objectives: Water quality monitoring will focus on the characterization of a variety of locations and conditions. This will include a combination of the following:

- planning and coordinating basin-wide monitoring;
- routine, regularly-scheduled monitoring to collect long-term information and support statewide assessment of water quality; and
- systematic, regularly-scheduled short-term monitoring to screen water bodies for issues.

Task Description: The Performing Party will monitor water quality in the Colorado River and tributaries downstream of O.H. Ivie Reservoir and coordinate with the Upper Colorado River Authority (UCRA) to ensure sites are monitored upstream of O.H. Ivie Reservoir. Coordinated monitoring meetings will be held annually and the statewide coordinated monitoring schedule will be maintained.

The Performing Party will complete the following subtasks:

**LCRA Monitoring**
The Performing Party will routinely monitor at least 44 sites in the Colorado River basin below O.H. Ivie Reservoir; 37 sites will be sampled six times per year, 6 sites will be sampled quarterly and one site will be sampled twice per year. Field data only will be collected from one site. The remainder of the sites will be analyzed for field, conventional, flow and bacteria parameters. Additional details about the monitoring activities conducted by the Performing Party are outlined in the Performing Party basin-wide QAPP.

**UCRA Monitoring**
In cooperation with the Upper Colorado River Authority (UCRA), the Performing Party will have at least 32 sites in the Colorado River basin above O.H. Ivie Reservoir routinely monitored. Stream sites will be monitored quarterly for flow, conventional and field parameters and bacteria. Reservoir sites will be monitored twice annually to include field and conventional parameters, bacteriological samples and elevation. Twenty-four hour diel monitoring will be done twice annually at three sites, with one event during the index period and one event during the critical period. Additional details concerning the monitoring activities conducted by UCRA are outlined in the Performing Party basin wide QAPP.

Additional details concerning the monitoring activities conducted by unfunded data providers will be outlined in the Performing Party basin-wide QAPP.

In FY 2021, partners will monitor at a similar level of effort as in FY 2020. The actual number of sites, location, frequency, and parameters collected for FY 2019 will be based on priorities identified at the basin Water Quality Advisory Committee and Coordinated Monitoring meetings and included in the amended Appendix B schedule of the QAPP.

All monitoring will be completed in accordance with the Performing Party's QAPP, the TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods (RG-415) and the TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416).

Coordinated Monitoring Meeting - The Performing Party will hold an annual coordinated monitoring meeting as described in the FY2020-2021 CRP Guidance. Qualified monitoring organizations will be invited to attend the working meeting in which monitoring needs and purposes will be discussed segment by segment and station by station. Information from participants and stakeholders will be used to select stations and parameters that will enhance overall water quality monitoring coverage, eliminate duplication of effort, and address basin priorities. A summary of the changes to the monitoring schedule will be provided to the participants within two weeks of the meeting. Changes to the monitoring schedule will be entered into the statewide Coordinated Monitoring Schedule and communicated to meeting attendees. Changes to monitoring schedules that occur during the year will be entered into the Coordinated Monitoring Schedule and communicated to meeting attendees.

The Performing Party will maintain the statewide Internet-based Coordinated Monitoring Schedule web site (CMS). The Performing Party will provide technical support to authorized users of the database by responding to calls, making changes to schedules and adapting the web page as determined by the TCEQ CRP Project Manager and the Performing Party Staff.

Progress Report - Each Progress Report will include all types of monitoring and indicate the number of sampling events and the types of monitoring conducted in the quarter.

## Deliverables and Dues Dates:

September 1, 2019 through August 31, 2020

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - December 15, 2019; March 15 and June 15, 2020
B. Coordinated Monitoring Meeting - between March 15 and April 30, 2020
C. Coordinated Monitoring Meeting Summary of Changes - within 2 weeks of the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2020

September 1, 2020 through August 31, 2021

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - September 15 and December 15, 2020; March 15 and June 15 and August 31, 2021
B. Coordinated Monitoring Meeting - between March 15 and April 30, 2021
C. Coordinated Monitoring Meeting Summary of Changes – within 2 weeks of the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2021

## Sample Design Rationale FY 2020

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the Lower Colorado River Authority coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed. A discussion of past or ongoing water quality issues should be provided here to justify the monitoring schedule.

The Upper Colorado River Authority (UCRA) will routinely monitor 48 sites in the Colorado River basin above O.H. Ivie Reservoir. Stream sites will be monitored quarterly for flow, conventional and field parameters and bacteria. Reservoir sites will be monitored twice annually to include field and conventional parameters, bacteriological samples and elevation. Twenty-four hour diel monitoring will be done twice annually at three sites, with one event during the index period and one event during the critical period.

The City of Austin will monitor 37 locations for conventional chemistry, bacteria, flow and field parameters. At five of these sites metals and organics in sediment will be collected.

LCRA will collect data from 57 locations. Parameters collected will include field, flow, bacteria and conventional chemistry.

Below is a segment by segment list of changes from the FY19 sampling schedule:

| Segment | Site | CE | Change |
|---|---|---|---|
| 1401 | | | No Changes |
| 1402 | | | No Changes |
| 1403 | 12216 | AU | Frequency change from 1 to 3 |
| 1403 | 12218 | AU | Frequency change from 1 to 3 |
| 1403 | 16322 | AU | Frequency change from 1 to 3 |
| 1403 | 16320 | AU | Frequency change from 1 to 3 |
| 1403 | 16321 | AU | Frequency change from 1 to 3 |
| 1403 | 12232 | AU | Investigating |
| 1404 | 12302 | LC | Frequency change from 12 to 6 |
| 1404 | 12307 | LC | Frequency change from 12 to 6 |
| 1404 | 12309 | LC | Frequency change from 12 to 6 |
| 1404 | 15428 | LC | Frequency change from 12 to 6 |
| 1404 | 12313 | LC | Frequency change from 12 to 6 |
| 1404 | 20070 | LC | Frequency change from 12 to 6 |
| 1404 | 12316 | LC | Frequency change from 12 to 6 |
| 1405 | 12319 | LC | Frequency change from 12 to 6 |
| 1406 | 12324 | LC | Frequency change from 12 to 6 |
| 1406 | 12327 | LC | Frequency change from 12 to 6 |
| 1406 | 12330 | LC | Frequency change from 12 to 6 |
| 1407 | 12336 | LC | Frequency change from 12 to 6 |
| 1408 | 12344 | LC | Frequency change from 12 to 6 |
| 1408 | 12347 | LC | Frequency change from 12 to 6 |
| 1408 | 12349 | LC | Frequency change from 12 to 6 |
| 1408 | 12352 | LC | Frequency change from 12 to 6 |
| 1408 | 12353 | LC | Frequency change from 12 to 6 |
| 1409 | | | No Changes |
| 1410 | | | No Changes |
| 1414 | | | No Changes |

| Segment | Site | CE | Change |
|---|---|---|---|
| 1415 | | | No Changes |
| 1416 | | | No Changes |
| 1417 | | | No Changes |
| 1427 | 12434 | AU | Frequency change from 1 to 3 |
| 1427 | 12440 | AU | Frequency change from 1 to 3 |
| 1427 | 12447 | AU | Frequency change from 1 to 3 |
| 1427 | 12451 | AU | Frequency change from 1 to 3 |
| 1427 | 12456 | AU | Frequency change from 1 to 3 |
| 1427 | 17275 | AU | Frequency change from 1 to 3 |
| 1427 | 12189 | GS | Discontinued |
| 1427 | 13653 | GS | Discontinued |
| 1427 | 12451 | GS | Discontinued |
| 1428 | 12231 | AU | Frequency change from 3 to 1 |
| 1428 | 15743 | AU | Frequency change from 3 to 1 |
| 1428 | 12235 | AU | Frequency change from 3 to 1 |
| 1428 | 12236 | AU | Frequency change from 3 to 1 |
| 1428 | 17469 | AU | Frequency change from 3 to 1 |
| 1428 | 12232 | GS | Discontinued |
| 1429 | 12476 | GS | Discontinued |
| 1430 | 13555 | AU | Frequency change from 3 to 1 |
| **Segment** | **Site** | **CE** | **Change** |
| 1430 | 12488 | AU | Frequency change from 3 to 1 |
| 1430 | 12495 | AU | Frequency change from 3 to 1 |
| 1430 | 12497 | AU | Frequency change from 3 to 1 |
| 1430 | 12500 | AU | Frequency change from 3 to 1 |
| 1434 | | | No Changes |

## Site Selection Criteria

This data collection effort involves monitoring routine water quality using procedures that are consistent with the TCEQ SWQM program. Some general guidelines are followed when selecting sampling sites, as outlined below, and discussed thoroughly in SWQM Procedures, Volumes I and II. Overall consideration is given to accessibility and safety. All monitoring activities have been developed in coordination with the CRP Steering Committee and with the TCEQ. The site selection criteria specified are those the TCEQ would like considered to produce data which is complementary to that collected by the state and which may be used in assessments, etc.

1. Locate stream sites so that samples can be safely collected from the centroid of flow. Centroid is defined as the midpoint of that portion of stream width which contains 50 percent of the total flow. If multiple potential sites on a stream segment are appropriate for monitoring, choose one that would best represent the water body, and not a site that displays unusual conditions or contaminant source(s). Avoid backwater areas or eddies when selecting a stream site.
2. At a minimum for reservoirs, locate sites near the dam (reservoirs) and in the major arms. Larger reservoirs might also include stations in the middle and upper (riverine) areas. Select sites that best represent the water body by avoiding coves and back water areas. A single monitoring site is considered representative of 25 percent of the total reservoir acres, but not more than 5,120 acres.
3. Monitoring sites are selected to maximize stream coverage or basin coverage. Very long segments may require more stations. As a rule of thumb, stream segments between 25 and 50 miles long require two stations, and longer than 50 miles require three or more depending on the existence of areas with significantly different sources of contamination or potential water quality concerns. Major hydrological features, such as the confluence of a major tributary or an instream dam, may also limit the spatial extent of an assessment based on one station.
4. Because historical water quality data can be very useful in assessing use attainment or impairment, it may be best to use sites that are on current or past monitoring schedules.
5. All classified segments (including reservoirs) should have at least one Monitoring site that adequately characterizes the water body, and monitoring should be coordinated with the TCEQ or other qualified monitoring entities reporting routine data to TCEQ.
6. Monitoring sites may be selected to bracket sources of pollution, influence of tributaries, changes in land

uses, and hydrological modifications.

7. Sites should be accessible. When possible, stream sites should have a USGS or IBWC stream flow gauge. If not, it should be possible to conduct flow measurement during routine visits.

# Monitoring Sites for FY 2020

Table B1.1 Sample Design and Schedule, FY 2020

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLORADO RIVER TIDAL AT SELKIRK ISLAND 2 MI DOWNSTREAM FROM FM 521 SW OF WADSWORTH | 12281 | 1401 | 12 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| COLORADO RIVER 20 METERS UPSTREAM OF FM 960 NEAR GLEN FLORA | 21809 | 1402 | 12 | LC | LC | RT | 6 | | 6 | 6 | | | | | | | | | | | | Added in 2017 to bracket site 12286 for bacteria impairment |
| COLORADO RIVER APPROXIMATELY 15 M OFF EAST BANK IMMEDIATELY DOWNSTREAM OF US ALT 90 NEAR ALTAIR | 18351 | 1402 | 12 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | Garwood site dropped FY 06 |
| COLORADO RIVER APPROXIMATELY 367 METERS DOWNSTREAM OF SH 183 IN WHARTON | 12286 | 1402 | 12 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| COLORADO RIVER AT OLD HWY 71 IN COLUMBUS | 12290 | 1402 | 12 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| COLORADO RIVER AT PECAN VALLEY ROAD BOAT RAMP 290 METERS NORTH AND 50 METERS EAST OF THE INTERSECTION OF PECAN VALLEY ROAD AND NELSON ROAD / WHARTON CR 167 | 21808 | 1402 | 12 | LC | LC | RT | 6 | | 6 | 6 | | | | | | | | | | | | Added in 2017 to bracket site 12286 for bacteria impairment |
| COLORADO RIVER AT SH 35 BRIDGE AT BAY CITY | 12284 | 1402 | 12 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FAYETTE RESERVOIR AT THE MID POINT OF THE LAKE OVER CEDAR CREEK CHANNEL APPROX 150 YDS NORTH OF THE BAFFLE DIKE | 17017 | 1402G | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE AUSTIN NEAR METROPOLITAN PARK TO THE SOUTH OF CITY PARK RD AND TO THE EAST OF WESTON RD | 12297 | 1403 | 11 | LC | AU | RT | 3 | 3 | 3 | | | | | | | | | | | | | added samples for the growing season (May, July, September) |
| LAKE AUSTIN NEAR METROPOLITAN PARK TO THE SOUTH OF CITY PARK RD AND TO THE EAST OF WESTON RD | 12297 | 1403 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE AUSTIN NEAR TOM MILLER DAM TO THE WEST OF LAKE AUSTIN BLVD | 12294 | 1403 | 11 | LC | AU | RT | 3 | 3 | 3 | | | | | | | | 1 | 1 | | | | field added to match Bact and Conv in consult W/ COA |
| LAKE AUSTIN NEAR TOM MILLER DAM TO THE WEST OF LAKE AUSTIN BLVD | 12294 | 1403 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| BULL CREEK 0.29MI SOUTH OF THE EASTERN INTRSCTION OF WYNDHAM DR AND CORLEY DR | 16322 | 1403A | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| BULL CREEK AT LOOP 360 1 MILE NORTH OF FM 2222 INTERSECTION WEST OF AUSTIN | 12216 | 1403A | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| BULL CREEK AT SPICEWOOD SPRINGS RD 5TH CROSSING TO THE WEST OF YUCCA MOUNTAIN RD | 12218 | 1403A | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNNAMED TRIB TO BULL CREEK 0.26MI WEST OF SOUTHERN PICKFAIR DR AND BRIGHTLING LANE INTRSCTION | 16320 | 1403H | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| UNNAMED TRIB TO BULL CREEK 0.33MI WEST OF SOUTHERN PICKFAIR DR AND BRIGHTLING LN INTRSCTION | 16321 | 1403I | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| SPICEWOOD TRIBUTARY OF SHOAL CREEK APPROX 13 METERS DOWNSTREAM OF CEBERRY DR IN AUSTIN | 16316 | 1403J | 11 | LC | AU | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Added for TMDL |
| TAYLOR SLOUGH SOUTH 20 M DOWNSTREAM OF PECOS STREET SOUTH OF RIVER ROAD IN AUSTIN | 17294 | 1403K | 11 | LC | AU | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Added for TMDL |
| LAKE TRAVIS AT ARKANSAS BEND TO THE WEST OF RANCH ROAD 620 | 12309 | 1404 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE TRAVIS IN BEE CREEK COVE 191 M NORTH AND 443 M WEST OF THE INTERSECTION OF BEE CREEK ROAD AND CORY LANE | 20070 | 1404 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE TRAVIS IN BIG SANDY CREEK COVE 1.25 KM DOWNSTREAM OF THE CONFLUENCE WITH LIME CREEK/BRUSHY CREEK 140 M SE OF THE END OF TRAIL END RD AND 1.4 KM | 12307 | 1404 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WEST OF FM 973 | | | | | | | | | | | | | | | | | | | | | | |
| LAKE TRAVIS IN THE HURST CREEK ARM APPROX 200 YDS UPSTREAM OF HURST HARBOR NEAR LADIN LANE IN LAKEWAY SUBDIVISION | 15428 | 1404 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE TRAVIS MID LAKE AT CONFLUENCE WITH COW CREEK ARM AT PACE BEND APPROXIMATELY 2.02 KILOMETERS TO THE SOUTH OF FM 1431 | 12313 | 1404 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE TRAVIS NEAR DAM AT LCRA TRAVIS COUNTY PARK | 12302 | 1404 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE TRAVIS NEAR SPICEWOOD EAST OF SHAW RD AND NORTH OF MULE SHOE BEND RD | 12316 | 1404 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE MARBLE FALLS NEAR MAX STARCKE DAM/TO SOUTHEAST OF COMINO REAL RD | 12319 | 1405 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE LYNDON B JOHNSON AT CONFLUENCE WITH LLANO RIVER ARM NEAR KINGSLAND APPROX 51 METERS TO THE SOUTHWEST OF SCENIC RD | 12330 | 1406 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LAKE LYNDON B JOHNSON AT CONFLUENCE WITH SANDY CREEK APPROX 453 METERS TO THE NORTH OF BLUE MOUNTAIN RD | 12327 | 1406 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE LYNDON B JOHNSON NEAR ALVIN WIRTZ DAM APPROX 658 METERS NORTH OF FM 2147 | 12324 | 1406 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| SANDY CREEK APPROXIMATELY 73 M DOWNSTREAM OF SH 71 SOUTH OF KINGSLAND | 12214 | 1406A | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| INKS LAKE NEAR INKS DAM APPROX 161 METERS TO THE NORTHEAST OF ROY INKS DAM | 12336 | 1407 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| CLEAR CREEK 1.28 KM UPSTREAM OF SH 29 | 18710 | 1407A | 11 | LC | LC | RT | 6 | | | 6 | | | | | | | | | | | | stopped conventional/metals in 2014. Will resume when TCEQ permit is approved |
| LAKE BUCHANAN AT CONFLUENCE OF COUNCIL AND MORGAN CREEKS APPROX 302 METERS SOUTH OF LAKESHORE RD | 12349 | 1408 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE BUCHANAN AT ROCKY POINT APPROX 1.3.KM NORTHWEST OF ROCKY RIDGE | 12347 | 1408 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE BUCHANAN NEAR BEAVER CREEK COVE ADJACENT TO PARADISE POINT APPROX 1.4 KM TO THE SOUTH OF RANCH | 12352 | 1408 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROAD 2341 | | | | | | | | | | | | | | | | | | | | | | |
| LAKE BUCHANAN NEAR BUCHANAN DAM APPROX 475 METERS TO THE WEST OF CORONADO RD | 12344 | 1408 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| LAKE BUCHANAN NEAR LAKE HEADWATER APPROX 687 METERS TO THE NORTHEAST OF LLANO TOW VALLEY RD | 12353 | 1408 | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |
| COLORADO RIVER AT US 190 EAST OF SAN SABA | 12355 | 1409 | 9 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| CHEROKEE CREEK AT FM 501 5 MILES WEST OF BEND | 12274 | 1409A | 9 | LC | LC | RT | 2 | 2 | 2 | 2 | | | | | | | | | | | | |
| COLORADO RIVER BRIDGE ON US 377 AT WINCHELL | 12358 | 1410 | 3 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| E V SPENCE RESERVOIR APPROX 5.3 KM WEST OF STATE HIGHWAY 208 | 12359 | 1411 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| E V SPENCE RESERVOIR AT DAM 1.75 KM WEST OF THE INTERSECTION OF FM 1904 AND ST LOOP 229 | 13863 | 1411 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| E V SPENCE RESERVOIR FM 2059 BRIDGE NEAR SILVER | 12360 | 1411 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| COLORADO RIVER AT MITCHELL CR343/PECAN CROSSING 7.5KM WEST OF SH208 AND 25.0KM SOUTH OF COLORADO CITY AT IH20 | 17002 | 1412 | 3 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | Chlorophyll 4x year |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEALS CREEK 35 M DOWNSTREAM OF SH 163 APPROXIMATELY 11 MI SOUTH OF WESTBROOK | 12156 | 1412B | 3 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | Chlorophyll 4x year |
| LAKE J B THOMAS AT DAM APPROX 1.0 KM WEST OF THE INTERSECTION OF FM 1298 AND SCURRY CR 8 | 21614 | 1413 | 3 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| PEDERNALES RIVER 20 METERS UPSTREAM OF PEDERNALES HILLS ROAD | 21398 | 1414 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | added in 2014 to replace 12372 (Ped at Johnson City) |
| PEDERNALES RIVER AT CR 962 AT HAMMETT'S CROSSING APPROX 532 METERS TO THE EAST OF HAMMETS ROAD | 12369 | 1414 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| PEDERNALES RIVER AT FM 1320 | 12375 | 1414 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| PEDERNALES RIVER AT GOEHMAN LANE CROSSING EAST OF FREDRICKSBURG OFF OF US 290 E APPROX 1.5 KM TO THE NORTH OF US HWY290 | 12377 | 1414 | 13 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | Added in 2016 after TCEQ San Antonio dropped |
| PEDERNALES RIVER AT US 87 APPROX 3.0 MILES SOUTH OF FREDERICKSBURG | 17472 | 1414 | 13 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| LLANO RIVER 0.4 MILE DOWNSTREAM FROM BRIDGE ON SH 16 AT LLANO | 12386 | 1415 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| LLANO RIVER AT YATES CROSSING ON RR 385 15 MI EAST OF JUNCTION IN KIMBLE COUNTY | 14231 | 1415 | 8 | LC | LC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LLANO RIVER COUNTY ROAD 6.5 MILES UPSTREAM FROM KINGSLAND/LLANO RIVER AT RANCH ROAD 3404 | 12383 | 1415 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| NORTH LLANO RIVER 75 METERS UPSTREAM OF US 377 IN JUNCTION | 21548 | 1415 | 8 | LC | LC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | moved upstream of 17245 in 2015 because site was frequently dry |
| SOUTH LLANO RIVER APPROXIMATELY 10 MI UPSTREAM OF SOUTH LLANO RIVER STATE PARK 204 YD UPSTREAM OF SECOND US 377 CROSSING | 18197 | 1415 | 8 | LC | LC | RT | 4 | 4 | 4 | | | | | | | | | | | | | |
| JOHNSON FORK CREEK 10 METERS UPSTREAM OF KIMBLE CR 410 SOUTHEAST OF JUNCTION | 21812 | 1415A | 8 | LC | LC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Site 13550 was taken over from TCEQ in 2014. Moved downstream in 2017 to capture more of the watershed |
| JAMES RIVER ON PRIVATE RANCH ROAD/ZESCH 1.2 MILES UPSTREAM OF LLANO RIVER 8 MI SOUTHWEST OF MASON | 12208 | 1415C | 8 | LC | LC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| JAMES RIVER/AT JAMES RIVER RD AT UPPER MASON COUNTY ROAD CROSSING 14 MILES SOUTHWEST OF MASON | 12210 | 1415C | 8 | LC | LC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| SAN SABA RIVER AT SH 16 NORTH OF SAN SABA | 12392 | 1416 | 9 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAN SABA RIVER IMMEDIATELY DOWNSTREAM OF US87 | 17004 | 1416 | 8 | LC | LC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| BRADY CREEK 2.81 KM DOWNSTREAM OF RR 714 | 14232 | 1416A | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |
| BRADY CREEK RESERVOIR MID LAKE NEAR DAM/SOUTHEAST BOUND OFF RANCH ROAD 3022 | 12179 | 1416B | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| LOWER PECAN BAYOU AT FM 573 SOUTHWEST OF MULLIN | 12394 | 1417 | 9 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| CONCHO RIVER 235 M DOWNSTREAM OF S BELL ST AND 540 M DOWNSTREAM FROM CONFLUENCE OF NORTH AND SOUTH FORKS IN SAN ANGELO | 12409 | 1421 | 8 | LC | UC | BS | 2 | | | 2 | 2 | | | | | | | | | | | 24 hour DO sampling |
| CONCHO RIVER 235 M DOWNSTREAM OF S BELL ST AND 540 M DOWNSTREAM FROM CONFLUENCE OF NORTH AND SOUTH FORKS IN SAN ANGELO | 12409 | 1421 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chloroyphyll  4x year |
| CONCHO RIVER AT FM1692 SOUTH OF MILES | 12403 | 1421 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chloroyphyll  4x year |
| CONCHO RIVER AT FM380 NEAR VERIBEST | 12407 | 1421 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| CONCHO RIVER AT FM381 | 12402 | 1421 | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| CONCHO RIVER BRIDGE ON US83 AT PAINT ROCK | 12401 | 1421 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONCHO RIVER SOUTH FORK AT US87 | 12416 | 1421 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| NORTH CONCHO RIVER 20M UPSTREAM OF IRVING STREET DAM IN SAN ANGELO TOM GREEN COUNTYTEXAS | 12412 | 1421 | 8 | LC | UC | BS | 2 | | | 2 | 2 | | | | | | | | | | | 24 hour DO sampling. Flow is measured at 15886 |
| NORTH CONCHO RIVER AT CADDO ST IN SAN ANGELO | 15886 | 1421 | 8 | LC | UC | BS | 2 | | | 2 | 2 | | | | | | | | | | | 24 hour DO sampling |
| NORTH CONCHO RIVER AT CADDO ST IN SAN ANGELO | 15886 | 1421 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| DRY HOLLOW CREEK AT HEADWATERS OF CHANDLER LAKE APPROXIMATELY 484 M TO THE EAST OF PRIVATE ROAD 1775 | 12257 | 1421A | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| KICKAPOO CREEK AT FM 380 | 12255 | 1421B | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| LIPAN CREEK APPROX 900M UPSTREAM OF THE CONFLUENCE OF THE CONCHO RIVER ON PRIVATE PROPERTY | 12254 | 1421C | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| LAKE NASWORTHY 40 M WEST OF DAM CENTERPOINT APPROX 1.3 KM TO THE NORTH OF COUNTRY CLUB RD | 12418 | 1422 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2X year at dam only , UCRA Sample Q2 and Q4 |
| LAKE NASWORTHY IN RIVER CHANNEL IN SOUTH CONCHO ARM 880 M WEST AND 220 M NORTH OF SOUTH COUNTRY CLUB ROAD AT LAS LOMAS COURT | 12419 | 1422 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | UCRA Sample Q2 and Q4 |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LAKE NASWORTHY MIDDLE COVE 120 M DOWNSTREAM OF CENTER POINT OF CONFLUENCE OF MIDDLE CONCHO AND SPRING CREEK CHANNELS | 12421 | 1422 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | UCRA Sample Q2 and Q4 |
| TWIN BUTTES RESERVOIR AT DAM 695 M SOUTH AND 195 M WEST OF INTAKE STRUCTURE TO LAKE NASWORTHY | 12422 | 1423 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| TWIN BUTTES RESERVOIR SOUTH POOL RIVER CHANNEL NEAR DAM APPROX 21 METERS TO THE WEST OF MOTL DAM | 12425 | 1423 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| SPRING CREEK AT LAKE AVENUE CROSSING IN MERTZON | 17346 | 1423A | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| SPRING CREEK S BANK 20 M DOWNSTREAM OF FM2335 NEAR TANKERSLEY | 12161 | 1423A | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |
| DOVE CREEK AT BRIDGE SE BOUND ON FM2335 NEAR KNICKERBOCKER | 12166 | 1423B | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |
| MIDDLE CONCHO RIVER AT FM 853 NORTH OF MERTZON | 16903 | 1424 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| SOUTH CONCHO RIVER 175 M DOWNSTREAM OF ANSON SPRING APPROXIMATELY 6.3 KM SOUTH OF CHRISTOVAL | 18712 | 1424 | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| SOUTH CONCHO RIVER IMMEDIATELY DOWNSTREAM OF US | 12427 | 1424 | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 277 AT CHRISTOVAL | | | | | | | | | | | | | | | | | | | | | | |
| WEST ROCKY CREEK AT FM 853 43.4 KM/27 MI NORTHEAST OF MERTZON | 12165 | 1424A | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| COLD CREEK 817 M UPSTREAM OF CONFLUENCE WITH SOUTH CONCHO RIVER APPROXIMATELY 5 KM SOUTH OF CHRISTOVAL | 18711 | 1424B | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| O C FISHER RESERVOIR MID LAKE 425 M WEST OF DAM RELEASE CONTROL TOWER | 12429 | 1425 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| N CONCHO RIVER AT SHERWOOD LANE CROSSING 2.1MI SE OF STERLING CITY .75MI SOUTH OF SH87 | 16779 | 1425A | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| NORTH CONCHO RIVER 664 METERS UPSTREAM OF WILLOW CREEK CONFLUNCE 6.2MI NW OF STERLING CITY ON SH87. | 16780 | 1425A | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| NORTH CONCHO RIVER AT COUNTY ROAD BRIDGE 0.6 MILE SOUTHWEST OF CARLSBAD | 12171 | 1425A | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |
| NORTH CONCHO RIVER AT RR 2034 SOUTHWEST OF WATER VALLEY | 17350 | 1425A | 8 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLORADO RIVER AT BLAIR RANCH APPROX 0.75 KM DOWNSTREAM OF MUSTANG CREEK CONFLUENCE SOUTHEAST OF BALLINGER | 17244 | 1426 | 3 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| COLORADO RIVER AT FM 2111 0.4 MI UPSTREAM FROM ROCKY CREEK 5.0 MI SW OF BALLINGER | 13651 | 1426 | 3 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |
| COLORADO RIVER AT FM3115 SOUTH OF MAVERICK | 16901 | 1426 | 3 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | |
| COLORADO RIVER USGS STATION IMMEDIATELY DOWNSTREAM OF SH 208 IN ROBERT LEE TEXAS | 18338 | 1426 | 8 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| OAK CREEK RESERVOIR MID LAKE NEAR DAM OFF BONNER POINT AND WEST OFF RANCH RD 3399 | 12180 | 1426A | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| ELM CREEK AT BALLINGER CITY PARK APPROX 71 M W TO CITY RD AND 120 M NE TO CROSSON RD UPSTREAM FROM STORAGE DAM | 12169 | 1426B | 3 | LC | UC | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Chlorophyll 4x year |
| BLUFF CREEK AT RUNNELS CR 351/HATCHELL-EAGLE-BRANCH ROAD | 17474 | 1426C | 3 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |
| COYOTE CREEK AT RUNNELS CR 342 NORTH OF BALLINGER | 16899 | 1426D | 3 | LC | UC | RT | 4 | 4 | | 4 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ONION CREEK 0.8 KM UPSTREAM OF RIVER PLANTATION DRIVE WEST OF INTERSECTION RIVER PLATATION DRIVE AND SAHALEE LANE SOUTH OF AUSTIN | 17275 | 1427 | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| ONION CREEK AT FM 150 0.61 KM DOWNSTREAM OF FLAT CREEK CONFLUENCE | 12451 | 1427 | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| ONION CREEK AT LOWER FALLS IN MCKINNEY FALLS STATE PARK 125 METERS DOWNSTREAM OF WILLIAMSON CREEK CONFLUENCE | 12440 | 1427 | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| ONION CREEK AT MCMORRIS RANCH 1.70 KM UPSTREAM OF COLORADO RIVER CONFLUENCE APPROX 450 METERS TO THE SOUTHEAST OF THREE ISLAND RD | 12434 | 1427 | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| ONION CREEK AT OLD HAYS CR 165/ONION CREEK AT SMITH RANCH RD NEAR THE INTERSECTION WITH LOOP 165 | 12456 | 1427 | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| ONION CREEK AT TWIN CREEKS ROAD 200 METERS UPSTREAM OF BEAR CREEK CONFLUENCE | 12447 | 1427 | 11 | LC | AU | RT | 3 | 3 | 3 | 3 | | | | | | | | | | | | |
| ONION CREEK AT US 183 SOUTHEAST OF AUSTIN | 12436 | 1427 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COLORADO RIVER AT COUNTY PARK IN WEBBERVILLE APPROX 334 METERS TO THE WEST OF WATER ROAD | 12466 | 1428 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| COLORADO RIVER AT FM 973 AT DEL VALLE | 12469 | 1428 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| COLORADO RIVER BRIDGE ON US 183 SOUTHEAST OF AUSTIN/COLORADO RIVER ON LOCKHART BRIDGE NEXT TO US 183 BRIDGE | 12474 | 1428 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| WALNUT CREEK 5 M DOWNSTREAM OP OLD MANOR ROAD AND 175 M EAST OF INTERSECTION OF OLD MANOR ROAD AND FERGUSON CUTOFF NORTH OF PRESERVE | 17469 | 1428B | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| WALNUT CREEK AT IH35 WEST FRONTAGE ROAD IN AUSTIN | 15743 | 1428B | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| WALNUT CREEK AT SOUTHERN PACIFIC RR APPROXIMATELY 26 M DOWNSTREAM OF AUSTIN AND NORTHWESTERN 1.2 MILES SOUTH OF FM 969 IN EAST AUSTIN | 12231 | 1428B | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| WALNUT CREEK IMMEDIATELY DOWNSTREAM OF LOOP 1/MOPAC EXPWY IN AUSTIN | 17251 | 1428B | 11 | LC | AU | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Quarterly sampling for TMDL in conjunction with EII |
| GILLELAND CREEK AT FM 973 SOUTH OF MANOR | 12235 | 1428C | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | for Gilleland TMDL IP monitoring |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GILLELAND CREEK AT US 290 NORTH OF MANOR | 12236 | 1428C | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | for Gilleland TMDL IP monitoring |
| GILLELAND CREEK IMMEDIATELY DOWNSTREAM OF WEBBERVILLE ROAD/FM 969 EAST OF AUSTIN | 17257 | 1428C | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| WALTER E LONG LAKE EASTERN ARM MID-LAKE 1.8 KM NORTH AND 315 M WEST OF DECKER CREEK RELEASE | 21023 | 1428K | 11 | LC | AU | RT | 3 | 3 | 3 | | | | | | | | | | | | | |
| WALTER E LONG LAKE WESTERN ARM MID-LAKE 725 METERS NORTH AND 1.17 KILOMETERS WEST OF DECKER CREEK RELEASE | 21022 | 1428K | 11 | LC | AU | RT | 3 | 3 | 3 | | | | | | | | | | | | | |
| WALTER E. LONG LAKE MID LAKE NEAR DAM 200 M NORTH AND 30 M WEST OF THE DECKER CREEK RELEASE | 20161 | 1428K | 11 | LC | AU | RT | 3 | 3 | 3 | | | | | | | | 1 | 1 | | | | |
| LADY BIRD LAKE AT LONGHORN DAM APPROXIMATELY 280 METERS SOUTH AND 250 METERS EAST OF INTERSECTION OF CANTERBURY STREET AND PEDERNALES STREET | 12476 | 1429 | 11 | LC | AU | RT | 9 | 9 | 9 | | | | | | | | 1 | 1 | | | | |
| TOWN LAKE NEAR HEADWATER/TOWN LAKE NEAR AT REDBUD ROAD | 12486 | 1429 | 11 | LC | AU | RT | 9 | 9 | 9 | | | | | | | | | | | | | |
| TOWN LAKE USGS SITE CC 45 METERS DOWNSTREAM FROM SOUTH 1ST ST | 14067 | 1429 | 11 | LC | AU | RT | 9 | 9 | 9 | | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WALLER CREEK AT 24TH STREET ON UT CAMPUS IN AUSTIN | 15962 | 1429C | 11 | LC | AU | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Added for TMDL |
| WALLER CREEK AT 2ND STREET/RED RIVER STREET IN AUSTIN/TO THE NORTHWEST OF TOWNLAKE | 12222 | 1429C | 11 | LC | AU | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Added for TMDL |
| WALLER CREEK AT AVENUE H AT THE ELISABET NEY MUSEUM | 16331 | 1429C | 11 | LC | AU | RT | 4 | 4 | 4 | 4 | | | | | | | | | | | | Added for TMDL |
| BARTON CREEK AT LOST CREEK BLVD | 13555 | 1430 | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| BARTON CREEK AT SH 71 5.3 MILES NORTHWEST OF OAK HILL | 12495 | 1430 | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| BARTON CREEK AT THE END OF PATTERSON LANE OFF FM2244 EAST OF INTERSECTION OF SH71 AND FM2244 | 15959 | 1430 | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| BARTON CREEK IMMEDIATELY DOWNSTREAM OF SHIELD RANCH ROAD 5.49 KM DOWNSTREAM OF HAYS CR 185 | 12497 | 1430 | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| BARTON CREEK JUST UPSTREAM UPPER DAM OF SWIMMING POOL UPSTREAM BARTON SPRINGS IN AUSTIN APPROX 75 METERS TO THE SOUTH OF WILLIAM BARTON RD | 12488 | 1430 | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |

| Site Description | Site ID | Segment | Region | SE | CE | MT | Field | Conv | Bacteria | Flow | 24 hr DO | AqHab | Benthics | Nekton | Metal W | Organic W | Metal Sed | Organic Sed | Fish Tissue | Amb Tox W | Amb Tox Sed | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BARTON SPRINGS 0.4 MI UPSTREAM FROM BARTON SPRINGS RD IN AUSTIN | 15696 | 1430A | 11 | LC | AU | RT | 20 | 20 | 20 | 20 | | | | | | | 2 | 2 | | | | |
| BARTON CREEK AT HAYS CR 169/BELL SPRINGS ROAD | 12500 | 1430B | 11 | LC | AU | RT | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| O H IVIE RESERVOIR IN COLORADO RIVER ARM AT ABILENE PUMP STATION | 12513 | 1433 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| O H IVIE RESERVOIR IN CONCHO RIVER ARM AT FM 1929 | 12512 | 1433 | 8 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| O H IVIE RESERVOIR NEAR DAM | 12511 | 1433 | 3 | LC | UC | RT | 2 | 2 | 2 | | | | | | | | | | | | | Chlorophyll 2x year, UCRA Sample Q2 and Q4 |
| COLORADO RIVER AT LOOP 150 SOUTH OF BASTROP | 12462 | 1434 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| COLORADO RIVER AT SH 71 AT LA GRANGE | 12292 | 1434 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| COLORADO RIVER DOWNSTREAM SH 95 1 MI AT OLIVE RD IN SMITHVILLE | 12293 | 1434 | 11 | LC | LC | RT | 6 | 6 | 6 | 6 | | | | | | | | | | | | |
| LAKE BASTROP OFF TRIANGLE POINT OVER SPICER CREEK CHANNEL APPROX 185M EAST OF LANDMARK/TRIANGLE POINT | 17020 | 1434C | 11 | LC | LC | RT | 6 | 6 | 6 | | | | | | | | | | | | | |

# Appendix A: Measurement Performance Specifications (Table A7.1-15

Measurement performance specifications define the data quality needed to satisfy project objectives. To this end, measurement performance specifications are qualitative and quantitative statements that:
clarify the intended use of the data
define the type of data needed to support the end use
identify the conditions under which the data should be collected

Appendix A of the QAPP addresses measurement performance specifications, including:
analytical methodologies
AWRLs
limits of quantitation
bias limits for LCSs
precision limits for LCSDs
completeness goals
qualitative statements regarding representativeness and comparability

The items identified above should be considered for each type of monitoring activity. The CRP encourages that
data be collected to address multiple objectives to optimize resources; however, caution should be applied when attempting to collect data for multiple purposes because measurement performance specifications
may vary according to the purpose. For example, limits of quantitation may differ for data used to assess standards attainment and for trend analysis. When planning projects, first priority will be given to the main use
of the project data and the data quality needed to support that use, then secondary goals will be considered.

Procedures for laboratory analysis must be in accordance with the most recently published edition of Standard Methods for the Examination of Water and Wastewater, 40 CFR 136, or otherwise approved independently. Only data collected that have a valid TCEQ parameter code assigned in Tables A7 are stored in SWQMIS. Any parameters listed in Tables A7 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

| TABLE A7.1 Measurement Performance Specifications for LCRA | | | | | |
|---|---|---|---|---|---|
| Field Parameters | | | | | |
| Parameter | Units | Matrix | Method | Parameter Code | Lab |
| TEMPERATURE, WATER (DEGREES CENTIGRADE)* | DEG C | water | SM 2550 B and TCEQ SOP V1 | 00010 | Field |
| TRANSPARENCY, SECCHI DISC (METERS)* | meters | water | TCEQ SOP V1 | 00078 | Field |
| SPECIFIC CONDUCTANCE,FIELD (US/CM @ 25C)* | us/cm | water | EPA 120.1 and TCEQ SOP, V1 | 00094 | Field |
| OXYGEN, DISSOLVED (MG/L)* | mg/L | water | SM 4500-O G and TCEQ SOP V1 | 00300 | Field |
| OXYGEN, DISSOLVED SATURATION (%)* | % | water | SM 4500-O G | 00301 | Field |
| PH (STANDARD UNITS)* | s.u | water | EPA 150.1 and TCEQ SOP V1 | 00400 | Field |
| DAYS SINCE PRECIPITATION EVENT (DAYS) | days | other | TCEQ SOP V1 | 72053 | Field |
| ELEVATION, RESERVOIR SURFACE WATER IN FEET | FT | water | other | 00062 | Field |
| RESERVOIR PERCENT FULL*** | % RESERVOIR CAPACITY | water | TWDB | 00053 | Field |
| RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING | NS | other | TCEQ Drought Guidance | 00051 | Field |
| TURBIDITY,FIELD NEPHELOMETRIC TURBIDITY UNITS, NTU | NTU | water | SM 2130B | 82078 | ELS |
| WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG) | NU | other | NA | 89965 | Field |
| MACROPHYTE BED AT COLLECTION POINT (%) | % | other | NA | 89926 | Field |
| PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER) | NU | other | NA | 89966 | Field |

* Reporting to be consistent with SWQM guidance and based on measurement capability.
*** As published by the Texas Water Development Board on their website
https://www.waterdatafortexas.org/reservoirs/statewide

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)

| TABLE A7.2 Measurement Performance Specifications for LCRA | | | | | |
|---|---|---|---|---|---|
| Flow Parameters | | | | | |
| Parameter | Units | Matrix | Method | Parameter Code | Lab |
| FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC) | cfs | water | TCEQ SOP V1 | 00061 | Field |
| FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry | NU | water | TCEQ SOP V1 | 01351 | Field |
| STREAM FLOW ESTIMATE (CFS) | cfs | Water | TCEQ SOP V1 | 74069 | Field |
| FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER | NU | other | TCEQ SOP V1 | 89835 | Field |

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020

U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136

American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

**TABLE A7.3 Measurement Performance Specifications for LCRA**

**Conventional Parameters in Water**

| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Precision (RPD) | Bias %Rec. of LCS | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| ALKALINITY, TOTAL (MG/L AS CACO3) | mg/L | water | SM 2320B | 00410 | 20 | 20 | NA | 20 | NA | ELS |
| RESIDUE, TOTAL NONFILTRABLE (MG/L) | mg/L | water | SM 2540D | 00530 | 5 | 1 | NA | NA | NA | ELS |
| **NITROGEN, AMMONIA, TOTAL (MG/L AS N)** | mg/L | water | EPA 350.1 Rev. 2.0 (1993) | 00610 | 0.1 | 0 | 70-130 | 20 | 80-120 | ELS |
| **NITROGEN, KJELDAHL, TOTAL (MG/L AS N)** | mg/L | water | EPA 351.2 Rev 2 (1993) | 00625 | 0.2 | 0.2 | 70-130 | 20 | 80-120 | ELS |
| NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N) | mg/L | water | SM 4500-NO3 H | 00630 | 0.05 | 0 | 70-130 | 20 | 80-120 | ELS |
| **PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)** | mg/L | water | EPA 365.4 | 00665 | 0.06 | 0 | 70-130 | 20 | 80-120 | ELS |
| **CHLORIDE (MG/L AS CL)** | mg/L | water | EPA 300.0 Rev. 2.1 (1993) | 00940 | 5 | 5 | 70-130 | 20 | 80-120 | ELS |
| **SULFATE (MG/L AS SO4)** | mg/L | water | EPA 300.0 Rev. 2.1 (1993) | 00945 | 5 | 5 | 70-130 | 20 | 80-120 | ELS |
| PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD | µg/L | Water | EPA 445.0 | 32213 | 3 | 2 | NA | NA | NA | ELS |
| **RESIDUE, TOT DISS,UNSPEC CALC BASED ON COND (MG/** | mg/L | water | calculation | 70294 | NA | NA | NA | NA | NA | ELS |
| **CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L** | µg/L | water | EPA 445.0 | 70953 | 3 | 2 | NA | 20 | 80-120 | ELS |

*Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

**TABLE A7.4 Measurement Performance Specifications for LCRA**

**Bacteriological Parameters in Water**

| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Log Difference of Duplicates | Bias %Rec. of LCS | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| **E. COLI, COLILERT, IDEXX METHOD, MPN/100ML** | MPN/100 mL | water | SM 9223-B** | 31699 | 1 | 1 | NA | 0.50* | NA | ELS |
| **ENTEROCOCCI, ENTEROLERT, IDEXX, (MPN/100 ML)** | MPN/100 mL | water | ASTM D-6503 | 31701 | 1*** | 10 | NA | 0.50* | NA | ELS |
| **E.COLI, COLILERT, IDEXX, HOLDING TIME** | hours | water | NA | 31704 | NA | NA | NA | NA | NA | ELS |

* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
** E.coli samples analyzed by these methods 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.
***Enterococcus Samples should be diluted 1:10 for all waters.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

| TABLE A7.5 Measurement Performance Specifications for UCRA | | | | | |
|---|---|---|---|---|---|
| Field Parameters | | | | | |
| Parameter | Units | Matrix | Method | Parameter Code | Lab |
| TEMPERATURE, WATER (DEGREES CENTIGRADE)* | DEG C | water | SM 2550 B and TCEQ SOP V1 | 00010 | Field |
| TRANSPARENCY, SECCHI DISC (METERS)* | meters | water | TCEQ SOP V1 | 00078 | Field |
| SPECIFIC CONDUCTANCE,FIELD (US/CM @ 25C)* | us/cm | water | EPA 120.1 and TCEQ SOP, V1 | 00094 | Field |
| OXYGEN, DISSOLVED (MG/L)* | mg/L | water | SM 4500-O G and TCEQ SOP V1 | 00300 | Field |
| OXYGEN, DISSOLVED SATURATION (%)* | % | water | SM 4500-O G | 00301 | Field |
| PH (STANDARD UNITS)* | s.u | water | EPA 150.1 and TCEQ SOP V1 | 00400 | Field |
| DAYS SINCE PRECIPITATION EVENT (DAYS) | days | other | TCEQ SOP V1 | 72053 | Field |
| RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)*** | FT ABOVE MSL | water | TWDB | 00052 | Field |
| RESERVOIR PERCENT FULL*** | % RESERVOIR CAPACITY | water | TWDB | 00053 | Field |
| RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING | NS | other | TCEQ Drought Guidance | 00051 | Field |
| RESERVOIR STORAGE - ACRE FEET | acre-feet | other | NA Calculation | 00054 | Field |
| MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)** | meters | other | TCEQ SOP V2 | 89864 | Field |
| MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)** | meters | other | TCEQ SOP V2 | 89865 | Field |
| POOL LENGTH, METERS** | meters | other | TCEQ SOP V2 | 89869 | Field |
| % POOL COVERAGE IN 500 METER REACH** | % | other | TCEQ SOP V2 | 89870 | Field |
| MACROPHYTE BED AT COLLECTION POINT (%) | % | other | NA Calculation | 89926 | Field |
| WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG) | NU | other | NA | 89965 | Field |
| PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER) | NU | other | NA | 89966 | Field |

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

| TABLE A7.6 Measurement Performance Specifications for UCRA | | | | | |
|---|---|---|---|---|---|
| **Flow Parameters** | | | | | |
| **Parameter** | **Units** | **Matrix** | **Method** | **Parameter Code** | **Lab** |
| **FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)** | cfs | water | TCEQ SOP V1 | 00061 | Field |
| **FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry** | NU | water | TCEQ SOP V1 | 01351 | Field |
| STREAM FLOW ESTIMATE (CFS) | cfs | Water | TCEQ SOP V1 | 74069 | Field |
| **FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER** | NU | other | TCEQ SOP V1 | 89835 | Field |

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard
Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

**TABLE A7.7 Measurement Performance Specifications for UCRA**

**Conventional Parameters in Water**

| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Precision (RPD) | Bias %Rec. of LCS | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| **NITROGEN, KJELDAHL, TOTAL (MG/L AS N)** | mg/L | water | EPA 351.2 Rev 2 (1993) | 00625 | 0.2 | 0.2 | 70-130 | 20 | 80-120 | ELS |
| NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N) | mg/L | water | SM 4500-NO3 H | 00630 | 0.05 | 0 | 70-130 | 20 | 80-120 | ELS |
| **PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)** | mg/L | water | EPA 365.4 | 00665 | 0.06 | 0 | 70-130 | 20 | 80-120 | ELS |
| **CHLORIDE (MG/L AS CL)** | mg/L | water | EPA 300.0 Rev. 2.1 (1993) | 00940 | 5 | 5 | 70-130 | 20 | 80-120 | ELS |
| **SULFATE (MG/L AS SO4)** | mg/L | water | EPA 300.0 Rev. 2.1 (1993) | 00945 | 5 | 5 | 70-130 | 20 | 80-120 | ELS |
| PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD | µg/L | Water | EPA 445.0 | 32213 | 3 | 2 | NA | NA | NA | ELS |
| **RESIDUE, TOT DISS,UNSPEC CALC BASED ON COND (MG/** | mg/L | water | calculation | 70294 | NA | NA | NA | NA | NA | NA |
| **CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L** | µg/L | water | EPA 445.0 | 70953 | 3 | 2 | NA | 20 | 80-120 | ELS |

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

**TABLE A7.8 Measurement Performance Specifications for UCRA**

**Bacteriological Parameters in Water**

| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Log Difference of Duplicates | Bias %Rec. of LCS | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| **E. COLI, COLILERT, IDEXX METHOD, MPN/100ML** | MPN/100 mL | water | SM 9223-B** | 31699 | 1 | 1 | NA | 0.50* | NA | ELS |
| **E.COLI, COLILERT, IDEXX, HOLDING TIME** | hours | water | NA | 31704 | NA | NA | NA | NA | NA | ELS |

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

** E.coli samples analyzed by these methods 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:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020

U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136

American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

| TABLE A7.9 Measurement Performance Specifications for UCRA | | | | | |
|---|---|---|---|---|---|
| 24 Hour Parameters in Water | | | | | |
| Parameter | Units | Matrix | Method | Parameter Code | Lab |
| TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG | DEG C | Water | TCEQ SOP V1 | 00209 | field |
| WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX | DEG C | Water | TCEQ SOP V1 | 00210 | field |
| TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN | DEG C | Water | TCEQ SOP V1 | 00211 | field |
| SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG | uS/cm | Water | TCEQ SOP V1 | 00212 | field |
| SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX | uS/cm | Water | TCEQ SOP V1 | 00213 | field |
| SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN | uS/cm | Water | TCEQ SOP V1 | 00214 | field |
| PH, S.U., 24HR MAXIMUM VALUE | std. units | Water | TCEQ SOP V1 | 00215 | field |
| PH, S.U., 24HR, MINIMUM VALUE | std. units | Water | TCEQ SOP V1 | 00216 | field |
| WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS | NU | Water | TCEQ SOP V1 | 00221 | field |
| SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS | NU | Water | TCEQ SOP V1 | 00222 | field |
| pH, # OF MEASUREMENTS IN 24-HRS | NU | Water | TCEQ SOP V1 | 00223 | field |
| **DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA** | mg/l | Water | TCEQ SOP V1 | 89855 | field |
| **DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA** | mg/l | Water | TCEQ SOP V1 | 89856 | field |
| **DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA** | mg/l | Water | TCEQ SOP V1 | 89857 | field |
| **DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS** | NU | Water | TCEQ SOP V1 | 89858 | field |

References:


United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020

U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136

American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

| TABLE A7.10 Measurement Performance Specifications for COA | | | | | |
|---|---|---|---|---|---|
| Field Parameters | | | | | |
| Parameter | Units | Matrix | Method | Parameter Code | Lab |
| TEMPERATURE, WATER (DEGREES CENTIGRADE)* | DEG C | water | SM 2550 B and TCEQ SOP V1 | 00010 | Field |
| TRANSPARENCY, SECCHI DISC (METERS)* | meters | water | TCEQ SOP V1 | 00078 | Field |
| SPECIFIC CONDUCTANCE,FIELD (US/CM @ 25C)* | us/cm | water | EPA 120.1 and TCEQ SOP, V1 | 00094 | Field |
| OXYGEN, DISSOLVED (MG/L)* | mg/L | water | SM 4500-O G and TCEQ SOP V1 | 00300 | Field |
| PH (STANDARD UNITS)* | s.u | water | EPA 150.1 and TCEQ SOP V1 | 00400 | Field |
| DAYS SINCE PRECIPITATION EVENT (DAYS) | days | other | TCEQ SOP V1 | 72053 | Field |
| DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE* | meters | water | TCEQ SOP V2 | 82903 | Field |
| MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)** | meters | other | TCEQ SOP V2 | 89864 | Field |
| MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)** | meters | other | TCEQ SOP V2 | 89865 | Field |
| POOL LENGTH, METERS** | % | other | TCEQ SOP V2 | 89869 | Field |
| % POOL COVERAGE IN 500 METER REACH** | % | other | TCEQ SOP V2 | 89870 | Field |

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

| TABLE A7.11 Measurement Performance Specifications for COA | | | | | |
|---|---|---|---|---|---|
| **Flow Parameters** | | | | | |
| **Parameter** | **Units** | **Matrix** | **Method** | **Parameter Code** | **Lab** |
| **FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)** | cfs | water | TCEQ SOP V1 | 00061 | Field |
| **FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry** | NU | water | TCEQ SOP V1 | 01351 | Field |
| STREAM FLOW ESTIMATE (CFS) | cfs | Water | TCEQ SOP V1 | 74069 | Field |
| **FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER** | NU | other | TCEQ SOP V1 | 89835 | Field |

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

| TABLE A7.12 Measurement Performance Specifications for COA | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Conventional Parameters in Water | | | | | | | | | | |
| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Precision (RPD) | Bias %Rec. of LCS | Lab |
| RESIDUE, TOTAL NONFILTRABLE (MG/L) | mg/L | water | SM 2540D | 00530 | 5 | 1 | NA | NA | NA | ELS |
| **NITROGEN, AMMONIA, TOTAL (MG/L AS N)** | mg/L | water | EPA 350.1 Rev. 2.0 (1993) | 00610 | 0.1 | 0.02 | 70-130 | 20 | 80-120 | ELS |
| **NITROGEN, KJELDAHL, TOTAL (MG/L AS N)** | mg/L | water | EPA 351.2 Rev 2 (1993 | 00625 | 0.2 | 0.2 | 70-130 | 20 | 80-120 | ELS |
| NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N) | mg/L | water | SM 4500-NO3 H | 00630 | 0.05 | 0.02 | 70-130 | 20 | 80-120 | ELS |
| **PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)** | mg/L | water | EPA 365.4 | 00665 | 0.06 | 0.02 | 70-130 | 20 | 80-120 | ELS |
| **CHLORIDE (MG/L AS CL)** | mg/L | water | EPA 300.0 Rev. 2.1 (1993) | 00940 | 5 | 5 | 70-130 | 20 | 80-120 | ELS |
| **SULFATE (MG/L AS SO4)** | mg/L | water | EPA 300.0 Rev. 2.1 (1993) | 00945 | 5 | 5 | 70-130 | 20 | 80-120 | ELS |
| PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD | µg/L | Water | EPA 445.0 | 32213 | 3 | 2 | NA | NA | NA | ELS |
| ORTHOPHOSPHATE PHOSPHORUS,DISS,MG/L,FILTER >15MIN | mg/L | water | EPA 300.0 Rev. 2.1 (1993) | 70507 | 0.04 | 0.04 | 70-130 | 20 | 80-120 | ELS |
| **CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L** | µg/L | water | EPA 445.0 | 70953 | 3 | 2 | NA | 20 | 80-120 | ELS |

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.13 Measurement Performance Specifications for COA

Bacteriological Parameters in Water

| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Log Difference of Duplicates | Bias %Rec. of LCS | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| E. COLI, COLILERT, IDEXX METHOD, MPN/100ML | MPN/100 mL | water | SM 9223-B** | 31699 | 1 | 1 | NA | 0.50* | NA | ELS |
| E.COLI, COLILERT, IDEXX, HOLDING TIME | hours | water | NA | 31704 | NA | NA | NA | NA | NA | ELS |

* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.
** E.coli samples analyzed by these methods 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:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

| TABLE A7.14 Measurement Performance Specifications for COA | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Metals in Sediment | | | | | | | | | | |
| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Precision (RPD of LCS/LCSD) | Bias %Rec. of LCS | Lab |
| ARSENIC, BOTTOM DEPOSITS (MG/KG AS AS DRY WT) | mg/kg | sediment | EPA 6020A | 01003 | 17 | 1 | 70-130 | 20 | 80-120 | DHL |
| CADMIUM,TOTAL, BOTTOM DEPOSITS (MG/KG,DRY WT) | mg/kg | sediment | EPA 6020A | 01028 | 2.5 | 0.3 | 70-130 | 20 | 80-120 | DHL |
| CHROMIUM,TOTAL, BOTTOM DEPOSITS (MG/KG,DRY WT | mg/kg | sediment | EPA 6020A | 01029 | 56 | 2 | 70-130 | 20 | 80-120 | DHL |
| COPPER, BOTTOM DEPOSITS (MG/KG AS CU DRY WT) | mg/kg | sediment | EPA 6020A | 01043 | 75 | 2 | 70-130 | 20 | 80-120 | DHL |
| LEAD, BOTTOM DEPOSITS (MG/KG AS PB DRY WT) | mg/kg | sediment | EPA 6020A | 01052 | 64 | 0.3 | 70-130 | 20 | 80-120 | DHL |
| MANGANESE, BOTTOM DEPOSITS (MG/KG AS MN DRY WG | mg/kg | sediment | EPA 6020A | 01053 | 550 | 2 | 70-130 | 20 | 80-120 | DHL |
| NICKEL, TOTAL, BOTTOM DEPOSITS (MG/KG,DRY WT) | mg/kg | sediment | EPA 6020A | 01068 | 24 | 2 | 70-130 | 20 | 80-120 | DHL |
| SILVER, BOTTOM DEPOSITS (MG/KG AS AG DRY WT) | mg/kg | sediment | EPA 6020A | 01078 | 1.1 | 0.2 | 70-130 | 20 | 80-120 | DHL |
| ZINC, BOTTOM DEPOSITS (MG/KG AS ZN DRY WT) | mg/kg | sediment | EPA 6020A | 01093 | 205 | 2.5 | 70-130 | 20 | 80-120 | DHL |
| IRON, BOTTOM DEPOSITS (MG/KG AS FE DRY WT) | mg/kg | sediment | EPA 6020A | 01170 | ### | 37.5 | 70-130 | 20 | 80-120 | DHL |
| MERCURY,TOT. IN BOT. DEPOS. (MG/KG) AS HG DRY WG | mg/kg | sediment | EPA 7471A | 71921 | 0.4 | 0.04 | 60-140 | 25 | 85-115 | DHL |
| SEDIMENT PRTCL.SIZE CLASS >2.0MM GRAVEL %DRY WT* | % DRY WT | sediment | ASTM D422 | 80256 | NA | NA | NA | %gravel 30 | NA | DHL |
| SOLIDS IN SEDIMENT, PERCENT BY WEIGHT (DRY) | % BY WT | sediment | ASTM D2216 | 81373 | NA | NA | NA | 30 | NA | DHL |
| TOTAL ORGANIC CARBON,NPOC(TOC), SED DRY WT,MG/KG* | mg/kg | sediment | EPA 9060 | 81951 | NA | 1500 | 65-135 | 30 | 65-135 | ELS** |
| PARTICLE SIZE, 0.05-0.002mm SILT, DRYWT,SEDIMENT* | % | sediment | ASTM D422 | 49906 | NA | NA | NA | %silt 30 | NA | DHL |
| PARTICLE SIZE,CLAY0.002-0.0002mm DRYWT,SEDIMENT%* | % | sediment | ASTM D422 | 49900 | NA | NA | NA | %clay 30 | NA | DHL |
| SEDIMENT PRCTL.SIZE CLASS 0.05-2.0MM,SAND,%DRYWT* | % | sediment | ASTM D422 | 49925 | NA | NA | NA | %sand 30 | NA | DHL |

*Sediment conventionals are not used for regulatory purposes but are extremely important in determining the availability of sediment toxics. Sediment grain size and TOC are recommended when analyzing metals and/or organics in sediment.
** While ELS is responsible for the final QA of TOC data, it subcontracts the analysis to Analysys Laboratory which is NELAP accredited for the method and matrix listed.

References:
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, 1998. (Note: The 21st edition may be cited if it becomes available.)
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TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.15 Measurement Performance Specifications for COA

Organics in Sediment

| Parameter | Units | Matrix | Method | Parameter Code | TCEQ AWRL | LOQ | LOQ Check Sample %Rec | Precision (RPD of LCS/LCSD) | Bias %Rec. of LCS | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| ACENAPHTHYLENE, DRY WT, BOTTOM (UG/KG) | µg/kg | sediment | EPA 8270D | 34203 | 65 | 10 | 20-200 | 30 | 44-125 | DHL |
| ACENAPHTHENE, DRY WT, BOTTOM (UG/KG) | µg/kg | sediment | EPA 8270D | 34208 | 44.5 | 10 | 20-200 | 30 | 46-125 | DHL |
| ANTHRACENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34223 | 422.5 | 10 | 20-200 | 30 | 53-125 | DHL |
| BENZO(B)FLUORANTHENE,SEDIMENTS, DRY WT, (UG/KG) | µg/kg | sediment | EPA 8270D | 34233 | NA | 10 | 20-200 | 30 | 45-125 | DHL |
| BENZO(K)FLUORANTHENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34245 | NA | 10 | 20-200 | 30 | 45-125 | DHL |
| BENZO(A)PYRENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34250 | 725 | 10 | 20-200 | 30 | 50-125 | DHL |
| CHRYSENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34323 | 645 | 10 | 20-200 | 30 | 53-125 | DHL |
| FLUORANTHENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34379 | 1115 | 10 | 20-200 | 30 | 54-125 | DHL |
| FLUORENE DRY, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34384 | 268 | 10 | 20-200 | 30 | 49-125 | DHL |
| INDENO (1,2,3-CD) PYRENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34406 | NA | 10 | 20-200 | 30 | 38-125 | DHL |
| NAPHTHALENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34445 | 280.5 | 10 | 20-200 | 30 | 40-125 | DHL |
| PHENANTHRENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34464 | 585 | 10 | 20-200 | 30 | 50-125 | DHL |
| PYRENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34472 | 760 | 10 | 20-200 | 30 | 46-125 | DHL |
| BENZO(GHI)PERYLENE / 1,12-BENZOPERYLENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34524 | NA | 10 | 20-200 | 30 | 38-126 | DHL |
| DIBENZ(AH)ANTHRACENE / 1,2,5,6-DIBENZANTHRACENE, DRY WT, BOT (UG/KG) | µg/kg | sediment | EPA 8270D | 34559 | 70 | 10 | 20-200 | 30 | 41-125 | DHL |
| PCP (PENTACHLOROPHENOL ), IN BOT DEPOS DRY, (UG/KG) | µg/kg | sediment | EPA 8270D | 39061 | NA | 133 | 20-200 | 30 | 25-125 | DHL |
| BHC-ALPHA ISOMER, BOTTOM DEPOS (UG/KG DRY SOL) | µg/kg | sediment | EPA 8270D | 39076 | 50 | 6 | 10-400 | 30 | 62-127 | DHL |
| ALDRIN, BOTTOM DEPOS. (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8270D | 39333 | 40 | 6 | 10-400 | 30 | 47-120 | DHL |
| CHLORDANE(TECH MIX&METABS) SED,DRY WT,UG/KG | µg/kg | sediment | EPA 8270D | 39351 | 2.4 | 6* | 10-400 | 30 | 63-141 | DHL |

| TABLE A7.15 con't Measurement Performance Specifications for COA con't. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DIELDRIN IN BOTTOM DEPOS. (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8270D | 39383 | 2.15 | 6* | 10-400 | 30 | 67-125 | DHL |
| ENDRIN, IN BOTTOM DEPOS. (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8270D | 39393 | 103.5 | 6 | 10-400 | 30 | 61-133 | DHL |
| TOXAPHENE, IN BOTTOM DEPOS., (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8270D | 39403 | 16 | 250* | 10-400 | 30 | 31-136 | DHL |
| PCBS, BOTTOM DEPOSITS, (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8082A | 39519 | 90 | 100* | 20-200 | 50 | 41-138 | DHL |
| DIAZINON, IN BOT. DEPOS., (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8270D | 39571 | NA | 6 | 10-400 | 30 | 37-159 | DHL |
| GUTHION, BOTTOM DEPOSITS, (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8270D | 39581 | NA | 6 | 10-400 | 30 | 40-160 | DHL |
| 2,4-D, BOTTOM DEPOSITS, (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8321A | 39731 | NA | 40 | 10-300 | 30 | 32-131 | DHL |
| 2,4,5-T, BOTTOM DEPOSITS, (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8321A | 39741 | NA | 40 | 10-300 | 30 | 43-139 | DHL |
| SILVEX, BOTTOM DEPOSITS, (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8321A | 39761 | NA | 40 | 10-300 | 30 | 46-128 | DHL |
| DEMETON, IN SEDIMENT (SYSTOX), DRY WEIGHT (UG/KG) | µg/kg | sediment | EPA 8270D | 82400 | NA | 6 | 10-400 | 30 | 40-160 | DHL |
| METHYL PARATHION, IN BOT. DEPOS., (UG/KG DRY SOLIDS) | µg/kg | sediment | EPA 8270D | 39601 | NA | 6 | 10-400 | 30 | 35-140 | DHL |
| DICAMBA, (BANVEL) SED, DRYWT (UG/KG) | µg/kg | sediment | EPA 8321B | 38444 | NA | 400 | 10-300 | 30 | 56-120 | DHL |
| DINOSEB, SED DRYWT, (UG/KG) | µg/kg | sediment | EPA 8321B | 38781 | NA | 40 | 10-300 | 30 | 20-131 | DHL |

References:
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