Clean Rivers Program
Audit Checklist

This checklist can be used to conduct Clean Rivers Program on-site project oversight and assessment activities. It is designed to evaluate the entire data collection process through final reporting of results, and to detect deficiencies and non-conformances so corrective actions can be taken. Formal oversight, including readiness reviews and monitoring systems audits, of all basin planning agency sub-tier participants is required under the Clean Rivers Program. The checklist is provided in sections and should be modified to fit the scope of either a readiness review, or a monitoring systems audit. Sections can be used by themselves to do an audit targeted towards a very specific function. Following the assessment, the completed checklist should be used to generate a report for use by the auditor and auditee.

Clean Rivers Program Audit Checklist	
Auditing Agency	
Name of Auditor(s)	
Subparticipant	
Date	
QAPP (including amendment number) in effect at time of audit	
Other QAPPs reviewed	

Operation	Yes	No	Comments
Section 1 - Documents (This section requires the examination of completed records. The auditor should record documented evidence in the comment section)			
Is there documentation of QAPP distribution, as required by the basin-wide QAPP?			
Is there documentation of QAPP amendment and appendix distribution, if applicable?			
Are there copies of QAPP adherence letters on record for all sub-tier participants? Or, have sub-tier participants signed the QAPP and amendments?			
Does the Quality Assurance Officer keep a non-conformance record and implement the corrective action procedure as described in the QAPP?			
Have any corrective action reports been generated associated with the current QAPP?			
Has the Quality Assurance Officer implemented the field training documentation requirement as described in the QAPP?			

Operation	Yes	No	Comments
Section 2 - Facility and Equipment (This section requires the examination of completed records. The auditor should record documented evidence in the comment section)			
Does the facility have adequate storage for field sampling equipment?			
What field equipment is available? (specify)			
Are multi-probe instruments stored in temperature controlled environments?			
Are probes and field equipment stored dry, with connectors separated, and open to the air?			
Are multi-probe sensors rinsed upon return from the field, and kept moist during storage?			
Are there thermometers in ovens, incubators, and refrigerators?			
Are thermometer temperatures checked and documented daily (or as required), and are units adjusted?			
Are thermometers calibrated annually?			
Is deionized or other laboratory pure water available? (describe)			
Is DI water conductivity checked and documented daily?			
Are balances and weights calibrated, annually?			

Operation	Yes	No	Comments
Section 3 - Calibration and Maintenance of Field Instruments (This section requires the examination of completed records. The auditor should record documented evidence in the comment section)			
Are calibrations documented in log books, or on field data sheets?			
Are calibrations performed in a temperature controlled environment?			
Are calibration standards stored in temperature controlled environments?			
Are commercial or prepared standards used for conductivity calibration?			
Are commercial or prepared standards used for pH calibration?			
Are calibration standards used before their expiration date?			
Are buffers and standards dated upon receipt, and when opened?			
What calibration sequence is followed? (Answer - specific conductance, pH, DO)			
Is each sensor allowed to equilibrate for 2 minutes, or until stable, before calibrating?			
Is the multi-probe instrument calibrated with a standard in the range of the specific conductance of water to be sampled?			

Operation	Yes	No	Comments
Are pH buffers of 4.0 and 7.0 used to calibrate when measuring pH in naturally acidic water?			
Are pH buffers of 7 and 10 used to calibrate when measuring pH in naturally basic waters?			
Is DO calibration performed by % saturation or mg/L? (specify)			
How is the local barometric pressure determined? (specify)			
Except for coastal areas, how is the local altitude obtained so barometric pressure may be decorrected? (specify)			
During DO sensor calibration:			
a. Is the water level just below the O-ring?			
b. Are water droplets on the membrane removed with a tissue?			
c. Is a lid or cap placed over the calibration cup to limit breezes?			
Are post-calibrations performed after every sampling run?			
Are post-calibration limits adhered to?			
Based on the examination of calibration log books, are post-calibrations acceptable?			
Are records of maintenance documented in equipment log books?			
Explain the routine maintenance conducted on field equipment.			
Are spare parts and/or backup equipment maintained?			

Operation	Yes	No	Comments
Section 4 - Documentation (This section requires the examination of completed records. The auditor should provide documented evidence in the comment section)			
Is field training documented?			
Does the QAO have records of field staff training?			
Are project staff members those documented in the QAPP?			
Is a QAPP distribution list maintained?			
Are documents retained and handled in accordance with the current QAPP?			
Is documentation citing sub-participant commitment to the QAPP maintained?			
Are the TCEQ SWQM procedures Manual, its interim updates, and QAPP available to staff?			
Is there a non-conformance report to log deficiencies?			
Are corrective action reports prepared to address non-conformances?			
Is the monitoring plan in the QAPP followed?			
Are field notebook or log entries made in permanent ink?			
Are field notebook or log errors corrected with a single line strike-out, dated, and initialed?			
Is the field data sheet, or field log used the one specified in the QAPP?			

Operation	Yes	No	Comments
Are the following sample collection activities documented on data sheets, or in field logs:			
a. Station ID?			
b. Location?			
c. Date & time & depth?			
d. Sample collector's name/signature?			
e. Values for all measured field parameters?			
f. Detailed observational data (water appearance, weather, etc.)?			
g. Other observational data, as applicable (biological activity, stream uses, unusual odors, missing parameters, etc.)?			
Is the COC form used consistent with the form in the QAPP?			
Is the following information documented on COCs:			
a. Date and time of collection?			
b. Site identification?			
c. Sample matrix?			
d. Number of containers?			
e. Preservative used?			
f. Analyses required?			
g. Name of collector?			
h. Custody transfer signatures?			
Is each sample transfer documented with a signature on the COC form?			
Are labels affixed to containers, or bottles marked with indelible ink?			
Is the following information labeled on each sample:			
a. Site identification?			
b. Date and time of sampling?			
c. Preservative?			
d. Designation of field-filtered?			
e. Analysis requested?			

Operation	Yes	No	Comments
Section 5 - Field Analysis			
Is the TCEQ SWQM Procedures Manual followed?			
Are in situ or bucket measurements performed on DO, temperature, pH, and conductivity? (In situ measurements should be taken when possible. The auditee should explain why bucket samples are taken.)			
If buckets are used for field measurements, is the bucket shaded from sunlight, and temperature recorded immediately after collection, before the sample warms?			
When measuring conductivity, is the probe placed carefully in the water to avoid the entrapment of air?			
Is salinity reported for estuarine or marine water bodies?			
When measuring field parameters, are sensors allowed to equilibrate for at least two minutes before taking readings?			
At what depth are field measurements taken in water bodies less than 1.5 ft deep? (Answer - 1/3 the water depth measured from the surface)			
At what depth are field measurements taken in water bodies between 1.5 ft and 5 ft in depth? (Answer - 1 ft below the surface)			
Are vertical profiles taken in water bodies >5 ft deep?			

Operation	Yes	No	Comments
Are DO, temperature, pH, and salinity reported to the nearest tenth place?			
Is conductivity reported to 3 significant figures?			
When measuring secchi disk transparency, is the mathematical average computed from the depth at which the disk disappeared and the depth to which it reappeared?			
In cases of shallow, clear water bodies, is the secchi disk transparency reported as > the depth of the water body?			
Is secchi disk transparency reported to 2 significant figures?			
Is flow severity reported correctly? (Answer - 1=no flow, 2=low flow, 3=normal flow, 4=flood, 5=high flow, 6=dry)			
When a flow severity of 1 is reported, is the instantaneous measurement of flow reported as “0.0” cfs?			
If the stream bed holds no water and the flow severity reported as 6 (dry) is any value reported for flow? (Answer-no)			
Are days since last significant precipitation recorded? How is this determined?			
If it is raining when samples are collected, what is reported for days since last significant precipitation? (Answer - <1day)			

Operation	Yes	No	Comments
Section 6 - Flow Monitoring			
Are flow measurements performed?			
Is a visual flow estimate made prior to performing the flow measurement?			
What type of flow meter is used?			
Discuss selection of flow measurement sites. Is laminar flow considered?			
If an ideal site is not available, is the cross section modified to provide acceptable conditions?			
How is stream width measured?			
If the stream is <10ft side, how many cross sections are required?(10)			
If the stream >10 ft wide, how many cross sections are required? (20)			
Are velocity measurements made at the mid-point of each cross section?			
Is depth of each cross section determined with a wading rod?			
Where in the cross section is velocity determined?			
How much time is allotted for each velocity determination?			
Are flow calculations correct? (Review computations)			

Operation	Yes	No	Comments
Section 7 - Field Bacteriological Analysis			
Are bacteriological samples collected? E. coli or Enterococcus?			
Are bacteriological samples placed on ice immediately upon collection?			
Are bacteriological samples collected at a depth of 1 foot in a direction away from the sampler?			
What containers are used for bacteriological sample collection?			
Are sample bottles for bacteriological analyses not pre-rinsed?			
Is there head space in the sample container, so that samples may be shaken prior to analysis?			
How and when is sodium thiosulfate added to bacteriological containers?			
Are sample analyzed within the 8 hour hold time?			
Are incubators maintained at 35º ± 0.5º C for Colilert analysis?			
For bacteriological analysis performed in the field:			
a. Are dilutions performed to bracket the concentration?			
b. Is a complete log kept with sample location, dilution, counts, analyst, etc.			
c. Is the initial and final incubator temperature checked and recorded?			
d. Is time in and time out of the incubator checked and recorded?			

Operation	Yes	No	Comments
Section 8 - Sample Collection			
Describe types of samples collected (analyses to be performed).			
Are water samples for parameters collected consistently with the parameters specified in the QAPP, Table A7? (Auditee should itemize samples collected)			
Are samples collected directly from the centroid of flow whenever possible, or is sampling equipment used? (describe)			
Is the sample bucket (if applicable) rinsed 3 times between sites?			
Are sampling containers used, as specified in the QAPP? (describe)			
Are chlorophyll samples collected in amber bottles?			
Is sample preservation, including icing, performed in the field, immediately upon collection?			
Are field splits collected for all samples on a 10% basis, at a frequency of no less than once per week?			
Are field equipment blanks collected for metals-in-water samples once per day, or on a 10% basis if more than 10 sample are collected in one week?			
Is quality-assured sample equipment used for metals-in-water samples?			
Are pre-cleaned, certified containers used for metals-in-water samples?			

Operation	Yes	No	Comments
Is a clean hand/dirty hand approach used for dissolved metals-in-water sample collection and filtration?			
Are dissolved metals-in-water samples filtered in the field in a clean room (e.g. box) atmosphere?			
Are dissolved metals-in-water samples preserved in the field? What amount and type of acid is used?			
What type of equipment is used for sediment analysis?			
In cases where wading is possible, is the dredge mounted on a pole rather than on a rope?			
After the dredge has accepted the sediment sample, is the dredge gently tipped to one side, and the overlying water decanted?			
Is the sediment sample deposited in a clean plastic pan for inspection, prior to be put in a container?			
Is only the top aerobic layer or two subsampled and put into the sample container?			

Operation	Yes	No	Comments
Section 9 - Biological Sampling			
Describe the type of biological monitoring performed.			
Describe training of biological monitors.			
Are appropriate staff members included on a current TPWD scientific collection permit?			
Is the field staff in possession of the current permit?			
Are electric shocking and seining employed during all fish surveys?			
Is electroshocking performed for a minimum 15 minutes?			
Are a minimum of 6 seine hauls performed?			
Describe the level of taxonomic identification for fish?			
Describe how voucher specimens are maintained, and questionable specimens are verified?			
Are 100 organism subsamples routinely counted for benthic data if kicknets are used to collect?			
Describe level of taxonomic identification for benthic data.			
Are habitat surveys conducted during each biological event?			
Is instantaneous flow measured and recorded for each biological event?			

Operation	Yes	No	Comments
Section 10 - Sample Receipt/Sample Control			
Does a system exist for logging in samples, and assigning sample ID numbers?			
Is the chain-of-custody record checked to ensure it matches sample labels?			
Are sample containers checked to be sure they are intact?			
Are specified holding times adhered to?			
How are samples stored?			
Is sample access controlled?			
Are samples and standards stored separately?			
Are samples returned to storage at the end of the day?			
Is the temperature monitored in storage units ($4^{o} \pm 2^{o}$ C)?			

Operation	Yes	No	Comments
Section 11 - Data Management, verification, and validation			
Who is the Data Manager? What is this person's role in respect to data management?			
Does the data manager keep electronic or physical logs of database activities?			
Who is the QAO? What is this person's role in respect to data management?			
How are field data entered into the planning agency database?			
Who reviews field data for conformance with the TCEQ SWQM Procedures Manual, and QC requirements? How is this review documented?			
Who performs a review of pre-calibration records and post calibration error checks to ensure they comply with error limits? How is this review documented?			
Who checks field data calculations, reductions, and transcriptions? How is this check documented?			
How are lab data entered into the planning agency database?			

Operation	Yes	No	Comments
Who reviews laboratory data for conformance with QAPP requirements, including sample handling, chain of custody, analytical and QC requirements, to include documentation, holding times, sample receipt, sample preparation, sample analysis, project and program QC results, and reporting? How is this review documented?			
Who checks lab data calculations, reductions, and transcriptions? How is this check documented?			
Who checks to ensure reporting limits are consistent with CRP requirements? How is this documented?			
Who evaluates analytical QC information to determine its impact on individual analyses? How is this documented?			
Who checks to be sure all laboratory samples analyzed for all parameters? How is this documented?			
Who evaluates data sets (field and laboratory) for reasonableness, and for corollary data agreement? How is this documented?			
Who confirms outliers? How is this done? How is this documented?			
Who checks field QC sample results to see they were analyzed, and the results are acceptable? How is this review documented?			

Operation	Yes	No	Comments
Are sampling and analytical data gaps checked to ensure data are from sites on the coordinated monitoring schedule?			
What role does the project manager play in confirming the reportability of data to the TCEQ?			
What are the verification and validation procedures for entering data from a cooperating partner?			
Does the data manager have review protocols that check for the following: (Explain)			
a. Data formatting errors?			
b. Record inconsistencies?			
c. Parameter code violations?			
d. Spelling errors?			
e. Duplicate records?			
f. Key fields lacking information?			
g. Missing values?			
h. Outliers?			
i. Orphans?			
j. Reporting limits not in QAPP?			
k. Stations not in QAPP			
l. Parameter codes not in QAPP?			
What is the process for submitting SLOC forms to the TCEQ?			
Does the laboratory report contain all elements required by the QAPP?			
Are quality-assured data maintained on the planning agency's web site?			
Describe the data correction process.			