



TASK 1: PROJECT ADMINISTRATION

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TASK 1: PROJECT ADMINISTRATION

Introduction

The administrative responsibilities and activities described in this task reflect the contract management and program development considerations that are integral to the Clean Rivers Program (CRP). The Texas Commission on Environmental Quality (TCEQ) encourages each Planning Agency to hold administrative costs to no more than 10 percent of the total contract budget. This request is made in support of the legislative intent of HB 1190 and its companion, SB 597, amending Section 26.0135(h) filed in February 1997. Administrative costs are expenditures charged under Task 1.

Contract Initiation and Development

Work Plan Development

The CRP work plan follows the format provided under the "Work Plan" section of the Guidance. There are seven tasks outlining the work that will be conducted under the contract. Each task in the work plan contains the following sections: objectives, description of work that will be done under the task, and deliverables and their due dates.

Objectives - Define the purpose of each task. Objectives are provided in the work plan shell. The Planning Agency should add other objectives in order to address basin priorities.

Task Description - Provide a detailed description of the work that will be done to accomplish the task objective(s) and complete the task's deliverables. Describe the level of effort needed to meet task objectives and basin priorities.

Deliverables and Due Dates - List the deliverables for each task under that task by ascending order of due date. A list of the deliverables is provided in the work plan shell. The Planning Agency may add other deliverables as needed in order to accomplish the task and address basin priorities. Wherever possible, all deliverables need to have specific due dates.



Budget Preparation

The cost reimbursement budget is the financial expression of the project as approved during the award process. This budget is included in the contract and will be subject to fiscal monitoring. It is the Planning Agency’s best estimate of the costs to successfully complete the contract deliverables *at the time the contract is executed*. It is necessary to submit budget and expense information for *for planning purposes*, as shown in the example below.

Budget Category	Total Allocation
Personnel/Salaries	106,800
Fringe Benefits (___%)	26,700
Travel	9,000
Supplies	6,000
Equipment	21,000
Contractual	57,000
Other	<u>64,000</u>
Total Direct Costs	\$290,500
Indirect Costs (___%)	0
TOTAL COSTS	\$290,500

The proposed budget, and supporting documentation justifying each line item cost, is reviewed, revised, and agreed to by both parties as part of the contract negotiations. For example, if the \$21,000 equipment cost is to purchase two pieces of equipment, a description of the equipment and estimated cost, identified by task, must be specified. When developing the proposed budget, the Planning Agency must follow the latest Uniform Grant Management Standards (UGMS) (<http://governor.state.tx.us/grants/what>) issued by the Governor’s Office of Budget and Planning to determine allowable costs.

Items included in the "Equipment" category are typically \$5000 or greater. Items of lesser cost, such as a computer should be included in the "Supplies" category. As stated in Exhibit 1B, certain items that are less than \$5000 are considered "controlled assets" and will need to be tracked on the Equipment Inventory.



Supporting Documentation Required with the Work Plan

The following items are supporting documentation that will be used to evaluate the work plan and prepare the contract. All but the first of these items are required to be submitted with the draft work plan and, if necessary, revised and re-submitted with the final work plan.

List of Deliverables	Provide a list of deliverables for the biennium in due date order and provide in electronic format with the final work plan.
Budget by Category	Use the budget categories shown in the table above to create the contract budget (see Exhibit 1A for each Planning Agency's CRP allocation for the contract period)
Budget by Task	For each task, list the estimated amount that will be expended for each fiscal year.
Personnel Eligibility List (PEL)	List all employees whose salaries will be wholly or partially funded by the CRP (see Exhibit 1G). Add any special notes to ensure PEL information can be reconciled against payroll and personnel records (e.g. salaries estimated based on X, or salaries include projected pay increases).
Fringe Rate Methodology	List all the types of expenses that will be included to calculate the rate and show the how those expenses are calculated (see Exhibit 1G).
Allocated Costs Documentation	For those Planning Agencies that have developed rates for the use of equipment, supplies, office space, telephone, printing or computer services, etc., explain the method by which these expenses will be charged.
Equipment Purchase Request	List all the equipment that you plan to purchase within the biennium. Any additional purchases must have prior written approval from the TCEQ CRP Project Manager.
Sub-recipients/ Vendors	List all the tasks and/or sub-tasks (deliverables and lab support) that may be completed by a sub-recipient or a vendor and the approximate cost for each.
Indirect Cost Rate Proposal	Describe the method for calculating reimbursement for indirect costs accompanied by required documentation. See Exhibit 1B for options.
Certification of Procurement Process	A written certification that the Planning Agency's procurement procedures conform to and reflect applicable state and local laws. Use the form provided in Exhibit 1I.
Training and Conferences	List any non-CRP training events or conferences that are planned or expected in support of each task. Any conferences or training events not provided on this list must be approved by the TCEQ CRP Project Manager prior to incurring costs for such events.



Time Frame for Submission of Work Plan and Supporting Documentation

To ensure contracts are implemented at the beginning of the State Fiscal Year, a time frame for submission, review, and approval is outlined. In the second fiscal year of the biennium, the schedule is:

May 1	Work plan and supporting documentation due to CRP Project Manager
May 1 - 31	Review by CRP Project Manager
May 31	CRP Project Manager's comments sent to Planning Agency
June 1 - 15	Planning Agency addresses comments
June 15	Planning Agency submits final work plan, and revised supporting documentation when necessary

Deliverables and Due Dates

Review of Deliverables by TCEQ

The CRP Project Manager requires *30 days to review* deliverables received from a Planning Agency and either approve them or request revisions. If a deliverable is submitted late and the CRP Project Manager does not have 30 days to review it before the associated reimbursement request is received, then the reimbursement request may be rejected and reconsidered 30 days after the delinquent deliverable is received. If the deliverable is incomplete or requires revision, then the reimbursement request will be rejected until the deliverable is approved. The progress report is the only exception to this process, since only 15 days are required for review.

If a *revised due date for a deliverable* has been approved by the CRP Project Manager, then the deliverable is not considered late on the original due date, and the processing of reimbursements will not be delayed. All deliverables must follow CRP guidelines and format, as stated in this guidance, and must be of acceptable quality before the deliverable is considered complete and reimbursement requests will be processed. The Planning Agency must address all comments provided by the TCEQ staff before submitting the revised deliverable to the CRP Project Manager.

Requesting Extension of a Due Date

When a deliverable cannot be completed and submitted to the TCEQ on or before the due date, it is the Planning Agency's responsibility to inform the CRP Project Manager as soon as possible. At least one week before a deliverable is due, the Planning Agency must submit a letter or e-mail stating: the reason for delaying a deliverable, the anticipated completion date, justification for extending the due date, and any other pertinent information. The CRP Project Manager will approve or disapprove this request. The deliverable will be considered late if the request is not approved by the CRP Project Manager. If the CRP Project Manager approves the extension, a document stating approval and referencing the change will be transmitted to the Planning Agency to confirm the approval. The progress report for the period must summarize the status of the delayed deliverable(s), indicate the date TCEQ provided approval of the extension, and specify the anticipated/actual submittal date.

Progress Reports

Progress reports (see example in Exhibit 1D) serve as an important form of communication for documentation of task activities and as a deliverable-tracking system. The progress report summarizes the Planning Agency's activities for each task and identifies problems and delays. The progress report is due on or before the 15th day of the month following the end of each quarter. The



last progress report for the biennium is due on August 31st because the contract cannot include deliverables outside the contract period. The progress report and attached documentation of activities conducted during the quarter are considered deliverables for the quarter they represent, and activities related to each expense should be represented on the progress report.

Format and Contents

The progress report contains three sections: Deliverable Status, Description of Activities, and Monitoring Activities.

The *Deliverable Status* form lists all deliverables (in order by date due) and provides specific information on submittal dates and circumstances regarding each deliverable. If a due date is revised, the Planning Agency must keep the original due date in the Date Due column and indicate the new due date in the Comments column, along with the date the CRP Project Manager approved the revision.

The *Description of Activities* form enables the Planning Agency to provide a detailed textual description of activities conducted under each task for each quarter. This information is important to provide a description of the types of activities and level of effort conducted under each task for a specific quarter. Even if there is no deliverable directly associated with an activity, the work or activity needs to be described in the most appropriate Task.

The *Monitoring Activities* form details the number of sites visited and types of samples taken during the quarter. If a sampling event did not take place as scheduled, the reason why and the anticipated make-up date should be provided. Descriptions of these occurrences and a discussion of any special studies (or other monitoring activities) can be provided on the *Description of Activities* form.

Conference Calls

Conference calls are an important method of communication for the CRP. It is important for each Planning Agency to have a representative present for each call. If a Planning Agency is unable to participate in a conference call, it must notify its CRP Project Manager if they will not attend. The Planning Agency will then be responsible for contacting the CRP Project Manager for the missed information.

Training Events and Conferences

The TCEQ may offer training courses throughout the contract period. Planning Agencies are encouraged to take advantage of these courses. It is advisable to consider at least two training events per year with the TCEQ when developing budgets and work plans.

To a limited extent, in-kind program participants may participate in TCEQ training events, however, pre-approval must be obtained from the CRP Project Manager beforehand. Because of factors such as limited space, cost, etc., pre-approval is necessary to ensure the training is efficient and effective. When factors are not limiting, in-kind participants are encouraged to participate in TCEQ sponsored training. Expenses associated with such participation are allowable and reimbursable under the contract.

Charges associated with training and/or conferences other than those hosted by the CRP are allowable if the event provides a benefit to the program. Such training events and/or conferences must be requested with the Work Plan, or otherwise be pre-approved by the CRP Project Manager. If



a training event is not pre-approved prior to incurring costs associated with the event, costs may not be reimbursed.

Annual Independent Audit

All Planning Agencies that receive a combined total greater than \$500,000 from the federal government and Texas state government agencies are required to have an annual independent audit conducted pursuant to applicable state law, regulations, and policies (UGMS, State of Texas Single Audit Circular). The Texas Water Code (Section 49.195) requires River Authorities and water districts to submit an annual independent financial audit to the TCEQ's Water Utilities Division for review. The Planning Agency Project Manager needs to verify each year (March 1) that the audit was submitted to the TCEQ's Utilities and Districts program.

Reimbursement Procedures

The TCEQ reimbursement schedule is based on the state fiscal year (September 1- August 31). Reimbursement of expenses will be made on a quarterly basis. It is the responsibility of the CRP Planning Agency to ensure the CRP Project Manager receives accurately completed reimbursement requests and required supporting documentation. When forms or documentation are incomplete, incorrect, illegible, or if deliverables have not been received by the due date, reimbursement request processing may be suspended.

The set of tables in Exhibit 1B describes each budget category and the documentation required for processing a reimbursement request. These tables are a *very useful resource* when preparing to submit a reimbursement request to the TCEQ.

Due Dates

Quarterly Reimbursement

The Planning Agency's reimbursement request is due at the TCEQ on the 30th of the month following the end of each quarter. The CRP Project Manager will begin review of the reimbursement request no sooner than the 30th of the month, or 15 days after the Progress Report is received, whichever is later. The timely receipt of accurate reimbursement requests is a performance measure used in the annual performance evaluation.

Final Payment

The final reimbursement request is due at the TCEQ no later than 60 days following the termination date of the contract. The TCEQ has the authority to refuse payment for any costs incurred within the term of the contract which are not submitted within 60 days after the termination date of the contract.

As a condition for final payment, the Planning Agency shall execute and deliver to the TCEQ a written release of all claims against the TCEQ arising under this contract.

Reimbursement Request and Review

The TCEQ has developed a checklist for the review of all reimbursement requests that is provided in Exhibit 1F. It is recommended that the CRP Planning Agency establish an internal system to review its reimbursement request prior to submission. If all required forms and documentation are received on time and are correct, the CRP Project Manager will process the reimbursement request using the guidelines of the Prompt Payment Act. However, because payment guidelines in the Prompt



Payment Act do not apply to outgoing grants, the time lines for finalizing review and payment of reimbursement requests may not exactly follow the Prompt Payment Act guidelines.

The following items are required before a reimbursement request can be processed:

- all required financial reimbursement forms are submitted, and the forms are legible, signed and dated, and completed correctly
- expenses for activities correlate with the reported activities in the Progress Report
- all expenses are described and allowable, with supporting documentation (Exhibit 1B)
- there is no deficit balance for any cost category that shows zero budgeted funds
- all water quality monitoring activities, including special studies, are conducted under an approved Quality Assurance Project Plan (QAPP), unless prior **written** approval is obtained from TCEQ
- all deliverables are submitted to TCEQ that were due within, and up to, this expense reimbursement period and have been approved by the CRP Project Manager
- documentation indicating approval by CRP Project Manager to delay a deliverable due date (e.g., copy of email, fax, or letter responding to Planning Agency's request)
- final reimbursement request is accompanied by a release of claims letter to the TCEQ

Documentation Required for Allowable Cost Categories

The Planning Agency will maintain documentation to show the work performed is a justifiable CRP activity, and that the expense was paid by the Planning Agency. The contract specifies the documentation that must be maintained and/or submitted for each cost. The Planning Agency shall make available for review, during fiscal compliance monitoring and upon request by the TCEQ staff, the financial information and data used by the Planning Agency or its designee (including independent financial auditors) in the preparation or support of any cost submission or cost (direct and indirect).

Allowable/Unallowable Costs

The TCEQ uses the UGMS to review the proposed budget and reimbursement requests to ensure only allowable costs are charged to the CRP. UGMS "Attachment A - The General Principles for Determining Allowable Costs" states that,

these principles are ... based on the fundamental premises that: (1) Governmental units are responsible for the efficient and effective administration of federal and state awards through the application of sound management practices (pg. 9).

In order to be allowable under federal or state awards, costs must, be necessary and reasonable for proper and efficient performance and administration of federal or state award (pg. 13).

A reasonable cost is further defined as a cost that, does not exceed that which would be incurred by a prudent person under the circumstances prevailing at the time the decision was made to incur the cost (pg. 13).

It is the responsibility of the Planning Agency to be familiar and in compliance with the UGMS. The Planning Agency must contact its CRP Project Manager regarding questions of allowability and/or allocability. A more complete description of allowable and unallowable costs is contained in the UGMS on the Web at www.governor.state.tx.us/divisions/stategrants/guidelines.

Allowable Costs: *Direct* costs are all costs which can be directly related to performance of the contract activities. A document describing the budget categories for allowable direct costs is provided



in Exhibit 1B, titled, "Budget Categories and Documentation Required to Process Reimbursement Requests."

Indirect Costs are those that have been incurred for common or joint purposes which cannot be readily identified to a particular contract without a disproportionate effort. A related concept is the allocation of shared costs, for example, when a Planning Agency charges a portion of the costs of space as a direct cost. See Exhibit 1B, Indirect Costs, for further description of requirements for applying indirect costs to the budget. An indirect cost rate greater than 10% will necessitate an audit by an independent certified public accountant, which specifically examines and reports the indirect costs for the biennium.

The TCEQ will only reimburse the Planning Agency for allowable costs considered reasonable and necessary to carry out the grant contract activities. Water quality monitoring activity costs are allowable only if they are conducted under an CRP approved QAPP. An allowable cost may not be a reimbursable cost if there is no line item cost approved in the budget or described in the contract.

Unallowable Costs: If an unallowable cost is submitted, that cost is deducted from the requested reimbursement amount before the request is processed. The following is a list of some unallowable costs which are not reimbursable by the TCEQ. This is **NOT** an all inclusive list:

- Contingencies (contribution to reserve) - excludes contributions to self-insurance fund, pension plan reserves, post- retirement health and benefit
- Contributions/Donations - includes cash, property, and services, by governmental units to others, regardless of the recipient
- Defense/prosecution of civil or criminal proceedings (exceptions)
- Entertainment
- Fines, Penalties, or Interest
- Fund raising and investment management (exceptions)
- Indirect or direct costs unsupported by required documentation
- Lobbying expenses
- Gratuities/Tips
- Travel costs that exceed the State of Texas reimbursement rates and guidelines

Reimbursable Costs

All allowable, approved line item costs incurred during the time period indicated on the Financial Status Report (FSR) (TCEQ Form 20248) are costs that the Planning Agency either:

paid prior to claiming reimbursement from the TCEQ—"CASH METHOD"

- Examples:
- supplies purchased at an office supply store with a check
 - monthly salaries paid on the last day of the time period

or

incurred by the last day of the time period and paid no later than 45 days after the end of the time period—"ACCRUAL METHOD"

- Examples:
- supplies purchased and charged to the Planning Agency credit card on the last day of the time period. Planning Agency pays credit card bill in full on the 25th of each month.
 - monthly salaries paid on the first day of the month after the end of the period.



Questioned or Disallowed Costs

Any reported cost may be questioned by the CRP Project Manager in order to determine whether it is allowable. A questioned cost will be referred back to the Planning Agency's Project Manager for clarification and may be disallowed if sufficient justification is not provided. A disallowed cost is one that is not allowable according to UGMS, not specified in an executed contract, and/or a cost for which there is no approved budget line item. A quarterly reimbursement request, desk review, or an on-site fiscal monitoring visit may result in either questioned or disallowed costs.

The Planning Agency may accept or dispute any questioned or disallowed cost. If the Planning Agency accepts the disallowance, they must inform the CRP Project Manager of this acceptance. Non-response within 30 days of notification by the TCEQ will indicate acceptance of the disallowance (including questioned cost). If the Planning Agency elects to dispute the disallowance, the Planning Agency must submit additional written justification/documentation to the CRP Project Manager within 30 days of notification. If upon further review, the TCEQ allows the cost, the CRP Project Manager informs the Planning Agency of the procedure to obtain reimbursement.

If the disallowed and/or questioned cost is disallowed after the additional submitted documentation is reviewed, the CRP Project Manager informs the Planning Agency in writing of the disallowance. The Planning Agency may submit a written request to the TCEQ CRP Section Manager to review the decision. The Section Manager will review the documentation within 30 days and either allow or disallow the disputed cost. The Planning Agency may request a review of the Section Manager's decision by the TCEQ CRP Division Director. If the Division Director concurs with the disallowance, the Planning Agency may appeal the decision to the TCEQ Deputy Director. If the Deputy Director concurs, the Planning Agency may request a review by the TCEQ Executive Director, who is the final arbiter.

Contract Management

Contract Changes

The Planning Agency may request a modification to the existing contract by submitting a written request to the CRP Project Manager. The request must include the proposed modification and its purpose in the appropriate format, and if affected by the modification, a revised budget and/or a scope of work for the affected task(s).

Generally, a *major change* will require an amendment to the contract and may include one or more of the following:

- an increase or decrease in the TCEQ obligation amount
- an extension or shortening of the term of the contract
- a significant change in the scope of work

An amendment will include a description of the proposed modification(s) and must be approved by the CRP Project Manager, the Program Manager, and TCEQ contract staff, as well as the Planning Agency's authorized representative. The Planning Agency must send in all requests for an amendment at least 60 days before initiating the change to allow ample processing time.

After receiving the written amendment request, the CRP Project Manager will draft an amendment describing all changes. After review and approval by the appropriate TCEQ staff, three copies of the



amendment documentation will be sent to the Planning Agency for review and approval. After the Planning Agency has signed the amendment, all three copies must be mailed back to the CRP Project Manager for TCEQ signature. A final signed copy will be returned to the Planning Agency for their records.

A *minor change* will require the written agreement of the both the TCEQ's and the Planning Agency's Project Managers. A copy of the agreement approving the minor change will be sent to the Planning Agency for its records. An extension of a deliverable due date, if approved by the TCEQ Project Manager, is a sample of a minor amendment.

Budget Revisions

It is the Planning Agency's responsibility to regularly compare actual costs to budgeted costs and inform the CRP Project Manager of potential budget revisions. Budget line item revisions often occur as a project progresses due to changing conditions, more accurate estimates of work, additional supplies required, and so on. Moving funds between budget categories will require sign-off from the CRP Project Manager and the Planning Agency's authorized representative. A Budget Revision Request Form (Exhibit 1G) must be completed and submitted to the CRP Project Manager. No budget change is effective until it is signed by the TCEQ's designated representative. Budget revisions should be submitted as needed.

Procurement of Sub-recipients or Vendors

The use of sources other than the CRP Planning Agency to complete portions, or all, of the CRP contract involves a number of steps to define how procurement, subcontract provisions, payment and oversight will be handled. These steps are complex and there are many instances where errors can be introduced into the process. Proper planning will reduce or eliminate the risk of error. Effective contract management is dependent on the interaction of the following elements:

Plan – Identify contracting objectives and contracting strategy.

Procurement – Fairly and objectively select the most qualified contractors.

Rate/Price Establishment – Establish processes that are cost-effective and aligned with the cost of providing the goods and services.

Contract Formation – Ensure the contract contains provisions that hold the contractor accountable for producing desired results.

Contract Oversight – Monitor and enforce the terms of the contract.

The new State of Texas Contract Management Guide generally describes the steps and elements and provides practical suggestions and best practices for contracting. Some of its text was borrowed for this portion of the CRP guidance and excerpts are included for quick reference in Exhibit 1C.

Procurement Procedures

There is no single "right" way to contract. Various types of purchases and contracts may require different practices, processes and strategies for successful implementation. The planning agency should use its own procurement procedures which reflect applicable state and local laws and regulations. The procurement procedures must be available for review during on-site visits, and may be audited or requested at any time by the TCEQ.

Procurement Deliverable to the TCEQ

The planning agency's procurement procedures and solicitation documents for subcontracts are not deliverables to the TCEQ, however, the CRP Project Manager needs some subcontract information to

adequately administer a contract and review invoices. The CRP Project Manager may request a planning agency to submit technical specifications on proposed procurements, *so it is important to communicate with them in advance about any subcontract plans*. In addition, the following information will be sent to the CRP Project Manager upon execution of subcontracts.

- Procurement Method Used (e.g. IFB, RFP - with or without prices, RFQ)
- Copy of fully-executed subcontract

The TCEQ may request additional procurement or subcontract documentation to be submitted during a desk review. See the checklist in Exhibit 1C for maintaining on-site subcontract administration files.

Procurement Methods

The procurement method chosen will be a major factor affecting time and steps in the planning process for developing subcontracts. The table in Exhibit 1C is an excerpt from Chapter 2 of the State of Texas Contract Management Guide and is provided to assist in selection of the appropriate procurement type. After the procurement method is determined, the solicitation document is prepared. Chapter 3 of the State of Texas Contract Management Guide provides information about preparing solicitations (www.tbpc.state.tx.us/communities/procurement/pub/contractguide).

Evaluation Criteria

The solicitation document (e.g. IFB, RFP, RFQ) must advise the respondents how subcontract proposals will be evaluated. The evaluation criteria must reflect the essential qualities or performance requirements necessary to achieve the objectives of the subcontract. The criteria should allow the proposals to be fairly evaluated. The State of Texas Contract Management Guide provides a sample evaluation criteria in Chapter 3. The Planning Agency must maintain documentation for each procurement showing the best subcontractors were fairly and objectively selected.

Subcontract Provisions

There are a number of provisions that are necessary for any subcontract. Certain considerations should be addressed before proceeding with a contract or agreement. For instance, when acquiring data management, Web site development, or mapping services, clauses regarding intellectual property, data, and publicity are absolutely necessary. The contract between the TCEQ and the Planning Agency lists a number of provisions that must be considered for inclusion in any subcontract for the protection of both the Planning Agency and the TCEQ. These provisions must be evaluated individually for any subcontract to determine their applicability. The subcontract should also include payment and oversight provisions. The State of Texas Contract Management Guide Chapter 6 explains general rules regarding contract formation and essential clauses, and Appendix 9 provides sample contract terms, but these resources do not replace the advice of an attorney. **ALWAYS CONSULT AN ATTORNEY FOR LEGAL ADVICE CONCERNING CONTRACTS.**

Payment Type

The payment type must be sufficient to ensure the Planning Agency pays fair and reasonable prices for services. Payments should be structured to fairly compensate the contractor and encourage timely and complete performance of work. Payments should be approximately equal to the value of the completed work and should be in accordance with the contract rate schedule. A description of the different payment types is provided in Exhibit 1C which is an excerpt from Chapter 3 of the State of Texas Contract Management Guide.

The circumstances of the procurement may impact the payment type that may be used. Specifically, a cost analysis must be performed for professional, consulting, and architectural or engineering



services contracts, sole source procurements, and when adequate price competition is lacking, such as intergovernmental contracts with universities or local governments. Invoices for these subcontracts must show actual costs as listed on the TCEQ Financial Status Report (20248 and supplement forms), including profit for private entities. Profit, if applicable, must be listed as a fixed amount at the beginning of the contract and not a multiplier based on another cost.

Oversight of Sub-Recipients and Vendors

The Planning Agency is responsible for assuring the subcontractor's compliance with performance and fiscal requirements outlined in applicable laws, regulations, and the subcontract itself. The oversight of subcontractors must be sufficient to ensure public funds are spent effectively and efficiently for quality services. Chapter 7 of the State of Texas Contract Management Guide covers four general administration and oversight processes, including: planning, monitoring performance, payment approval and change management. Exhibit C includes an excerpt from Chapter 7 which is a checklist for assembling a master contract administration file to document these processes.

Subcontractor Evaluations

Planning Agencies will be required to submit to the TCEQ performance evaluations of subcontractors performing work under CRP. The Contractor Evaluation form (Exhibit 1H) will be completed and submitted with each contract year's 4th quarter progress reports in order to document performance of subcontractors.

Historically Underutilized Business

The TCEQ encourages the use of historically underutilized business (HUB) participation in procurement and contracting processes and recommends the Planning Agency make a *good faith effort* (GFE) to assist HUBs in receiving contract awards issued by the State. A good faith effort demonstrates that equal opportunity is provided to underutilized minority and women-owned business enterprises in procurement and vendor purchases. Planning Agencies (and subcontractors) shall make an effort to acquire services, supplies, and equipment through a certified HUB vendor.

A HUB is a business formed for the purpose of making a profit in which at least 51% of the ownership is by a person(s) whose business enterprises have been historically socially disadvantaged because the owner(s) is a member of the following groups: Black American, Hispanic American, Asian Pacific American, Native American, and Women.

HUB Certification

In order to qualify for status as a HUB, vendors or subcontractors must be certified through the Texas Comptroller Office (CPA). When the Planning Agencies utilize a HUB service, the correct vendor identification number must be used (obtained by calling the CPA at 512/463-5872 or on the Internet at www.tbpc.state.tx.us/communities/procurement/prog/cmb1). A Planning Agency may encourage a vendor to apply for HUB certification with the Comptroller, if the vendor may qualify as a HUB. Applications for HUB certification may be obtained by calling the CPA.

Contract Monitoring

Fiscal monitoring includes a review of financial information to determine fiscal integrity and compliance with fiscal, state, and contractual requirements. It ensures state funds are spent properly and accurately accounted for, deliverables are received on schedule, contractor performance is evaluated, deficiencies are corrected, and invoices are adequately supported by reasonable assurance that the agency got what it expected and paid appropriately. A risk-based approach



dictates that not every transaction requires 100 percent scrutiny. By performing desk reviews and on-site fiscal monitoring visits, the TCEQ can allow contractors to provide limited back-up documentation with its reimbursement requests and maintain the documentation for periodic review during desk reviews and/or site visits.

Performance Self Evaluation

As recommended by the State Auditor's Office, Planning Agencies will be evaluated by their CRP Project Managers annually, using the Contractor Evaluation form (Exhibit 1H). This form will be utilized by TCEQ staff in establishing a risk-based methodology for prioritizing and tailoring desk and on-site fiscal reviews. The Planning Agency will use the form to do a self-evaluation, and send a copy to its CRP Project Manager. The CRP Project Manager will then do his or her evaluation. A copy of the completed evaluation will be sent to the Planning Agency, which may send its written comments on the evaluation to its CRP Project Manager. The Planning Agency may request a meeting with the Project Manager to discuss the evaluation.

Risk Assessments

The TCEQ performs a risk assessment of contractors to establish monitoring work schedule priorities for each fiscal year. The CRP Planning Agencies are monitored annually by either a desk review or a site visit, based upon the risk assessment.

Desk Reviews

Annual submission documentation is reviewed in-house by a TCEQ fiscal monitor. Planning Agencies will be notified 30 days before the invoice due date when they must provide the additional supporting documentation listed in the tables in Exhibit 1B. The TCEQ notice of the desk review will specify the documentation each Planning Agency must provide. It is important to read the notice as some desk reviews may not require all of the information listed in Exhibit 1B. Planning Agencies scheduled for a site visit will not be required to have a desk review that year.

Site Visits

Based upon the risk assessment, some Planning Agencies will be scheduled for a contract fiscal monitoring site visit. An on-site visit involves a thorough review of records for one or more quarters to verify accuracy of reporting and adequacy of fiscal management processes.

TCEQ Compliance Audits

The TCEQ internal audit group may elect to conduct an audit of financial and program records of individual Planning Agencies throughout the contract period.



Exhibit 1A

FY 2010-2011 Budget Allocations



EXHIBIT 1A
FY 2010 - 2011 BUDGET ALLOCATIONS

Planning Agency	FY 2008	FY 2009	Total Allocation
BRA (12)	421,580	421,580	843,160
GBRA (17 & 18)	143,341	143,341	286,682
HGAC (9, 10, 11, 13)	1,022,416	1,022,416	2,044,832
IBWC (23)	282,973	282,973	565,946
LNRA (16)	105,139	105,139	210,278
LCRA (14 & 15)	404,256	404,256	808,512
ANRA & LNVA (6 & 7)	349,164	349,164	698,328
NETMWD (4)	105,139	105,139	210,278
NRA (20, 21, & 22)	274,136	274,136	548,272
RRA (1 & 2)	329,419	329,419	658,838
SARA (19)	209,403	209,403	418,806
SRA (5)	331,490	331,490	662,980
SRBA (3)	105,138	105,138	210,276
TRA (8)	416,406	416,406	832,812
TOTALS	\$4,500,000	\$4,500,000	\$9,000,000



Exhibit 1B

**Budget Categories and Documentation
Required to Process
Reimbursement Requests**



**Budget Categories and Documentation Required
to Process Reimbursement Requests - Exhibit 1B**

<p><u>PERSONNEL/SALARY:</u> Compensation of employees for the time devoted and identified specifically in the performance of CRP tasks.</p>	<p><u>REFERENCES</u> UGMS <u>Part II</u>, Att B, (11)(h) CRP Contract Costs & Payments 1.9 <u>and</u> 2.14</p>
<p><u>QUARTERLY</u> TCEQ-20248-1 listing: - employee name; - title/position; - salary for the period; and - task number(s) worked.</p> <p>PELs should be submitted annually with the 1st quarter invoices. ALL Employee Changes require a revised Personnel Eligibility List (PEL) (Exhibit II) to be submitted with the applicable quarter's invoice, including hire date for new employees and date last employed on project for employees no longer working on project. <u>Add any special notes</u> to ensure PEL information can be reconciled against payroll and personnel records (e.g. salaries are estimated based on X, or salaries include projected pay increases).</p>	<p><u>SITE VISIT or DESK REVIEW</u> <u>Time Sheets</u> must: -reflect an <u>after-the-fact distribution</u> of actual activity; -account for <u>total activity</u> for which the employee is compensated; -be prepared <u>at least monthly</u> and must <u>coincide with</u> one or more <u>pay periods</u>; -be <u>signed</u> by the employee and supervisory official having first hand knowledge of the worked performed;</p> <p>Reports from <u>electronic</u> timekeeping systems must meet the above standards.</p> <p>Charges for salaries should match <u>payroll documentation</u>.</p> <p><u>Personnel files and policies</u> must be available for on-site or desk reviews.</p>
<p><u>FRINGE BENEFITS:</u> Costs of leave, insurance, social security and Medicare contributions, pensions, unemployment benefit plans, etc.</p>	<p><u>REFERENCES</u> UGMS <u>Part II</u>, Att B, (11)(d) <u>and</u> Att C, E(3)(d), <u>and</u> Att E, F(1) CRP Contract Authorized Expense Budget 1.1</p>
<p><u>QUARTERLY</u> Show <u>calculation</u> on TCEQ-20248-1 using <u>rate approved in contract</u>, or specify if benefits are adjusted to actual. No additional documentation is required with the reimbursement request</p>	<p><u>SITE VISIT or DESK REVIEW</u> <u>Itemize</u> employee benefits with percentages and/or cost for each employee listed on the Personnel/Salary Section of TCEQ-20248-1. Benefits must be granted according to <u>established written policies</u> which should available for on-site or desk reviews.</p>
<p><u>TRAVEL:</u> Costs (within State rates) of transportation, lodging, meals, and related expenses for employees traveling on CRP business. Travel costs for committee members and volunteers <u>cannot</u> be reimbursed without prior written authorization from TCEQ project manager.</p>	<p><u>REFERENCES</u> UGMS <u>Part II</u>, Att B, (43) CRP Contract Costs & Payments 1.10 <u>and</u> 2.14 State of Texas Travel Allowance Guide (Comptroller)</p>
<p><u>QUARTERLY</u> TCEQ-20248-1 listing: - Name of Traveler; - Date(s) of travel; - Destination and purpose of travel, including titles of workshops, training, or meetings; - Mode of transportation (personal car, agency vehicle, rental car, airplane, etc.); - Costs for meals, lodging, and transportation (including mileage); and - Task(s) to which each activity applies.</p> <p><i>Progress Report</i> should include <u>brief explanation</u> of how the activity supports the CRP.</p>	<p><u>SITE VISIT or DESK REVIEW</u> Copies of <u>receipts</u> for hotel accommodations, public transportation, airfare, rental cars, and meals (when available), etc. A signed and approved travel reimbursement invoice may be provided if all of the required information is recorded.</p> <p><u>Mileage logs</u> for agency vehicles used for CRP travel should be available for on-site or desk reviews.</p> <p><u>Travel policies</u> should be available for on-site or desk reviews.</p>



**Budget Categories and Documentation Required
to Process Reimbursement Requests - Exhibit 1B (cont'd.)**

<p>Supplies: Costs for materials necessary to carry out the program. This includes equipment with a purchase price (including freight) of less than <u>5,000</u>.</p> <p>Examples: Chemical/Gases, Fuels /Lubricants, Computer Software/Supplies, Office Supplies, Medical Supplies, Cameras, Computers, Furniture/Equipment (< \$5,000). The CRP has designated the following purchases to be controlled assets which should also be included in the planning agency's Equipment Inventory control system:</p> <ul style="list-style-type: none"> -Laptop Computers -Digital Projectors -GPS Receivers -Laboratory Equipment -Monitoring equipment (Multiprobes, flow meters, etc) 	<p>REFERENCES</p> <p>UGMS <u>Part II</u>, Att B, (30) and <u>Part III</u>, Subpart C, (33) and (36)(d)</p> <p>CRP Contract Costs & Payments 2.15</p> <p>State of Texas Purchase Policies & Procedures Guide</p>
<p>QUARTERLY TCEQ-20248-2 listing materials and supplies purchased for the program and task correlation.</p> <p>Itemization should be sufficient to allow TCEQ to determine the allowability of the cost. <u>No receipts are required</u> to be submitted unless the project manager requests records to verify allowability.</p>	<p>SITE VISIT or DESK REVIEW Copies of <u>purchase orders</u> or vendor-submitted <u>invoices</u> marked received, approved for payment, with date received, category and funding source charged to, date of payment, or <u>copy of check</u>. Written justification and <u>calculation worksheets</u> must be available for costs <u>allocated</u> between two or more funding sources. <u>Procurement records and procedures</u> must be available for on-site and desk reviews.</p>
<p>Other: Direct cost items not identified and explained in the above categories. Examples: rent, laboratory expenses, utilities, telephone, data processing services, printing and reproduction, postage and shipping, contract clerical or other personnel, contract CPA or bookkeeping services, janitorial services, exterminating services, security services, insurance and bonds, equipment repairs or services, books, periodicals, memberships.</p>	<p>REFERENCES</p> <p>UGMS <u>Part II</u>, Att B and Att C</p> <p>CRP Contract Costs & Payments 2.15</p> <p>State of Texas Purchase Policies & Procedures Guide</p>
<p>QUARTERLY TCEQ-20248-2 listing:</p> <ul style="list-style-type: none"> -Description such as number of months cost covers (e.g., 3 months rent @ \$/mo.) -Task correlation. <p>Itemization should be sufficient to allow TCEQ to determine the allowability of costs. <u>No receipts are required</u> to be submitted unless the project manager requests records to verify allowability.</p>	<p>SITE VISIT or DESK REVIEW Copies of <u>purchase orders</u> or vendor-submitted <u>invoices</u> marked received, approved for payment, with date received, category and funding source charged to, date of payment, or <u>copy of check</u>. Written justification and <u>calculation worksheets</u> must be available for costs <u>allocated</u> between two or more funding sources. <u>Procurement records and procedures</u> must be available for on-site and desk reviews.</p>



**Budget Categories and Documentation Required
to Process Reimbursement Requests - Exhibit 1B (cont'd.)**

<p>Equipment: Tangible, nonexpendable personal property having a useful life of more than one year and an acquisition cost of \$5,000 or more. UGMS allows state awarding agencies to specify special treatment for items of equipment with costs under \$5,000.</p>	<p>REFERENCES UGMS <u>Part II</u>, Att B, (16), (20) <u>and</u> <u>Part III</u>, Subpart C, (3), (32) and(36) CRP Contract Costs & Payments 2.13 <u>and</u> 2.16 CRP Contract General Conditions 2.14 <u>and</u> 2.15 <u>and</u> 3.3.7 State of Texas Purchase Policies & Procedures Guide</p>
<p>QUARTERLY TCEQ-20248-3 listing: - Description of equipment - Serial # - Unit cost - Total cost - Task Correlation.</p> <p><u>Receipts are required</u> for costs itemized in this category. In lieu of a receipt, a purchase order, an invoice (marked paid), a canceled check, or other evidence of payment may be submitted.</p> <p>Submit an updated <u>Equipment Inventory List</u> (Exhibit 1J) for all additions/changes.</p> <p>Equipment costing less than \$5,000 may be reported under either the ‘supplies’ or ‘equipment’ categories. However, all equipment, including CRP-designated controlled assets, must be listed in the equipment inventory. TCEQ may disallow the cost of equipment purchased without the Project Manager’s prior approval.</p>	<p>SITE VISIT or DESK REVIEW Copies of <u>purchase orders</u> or vendor-submitted <u>invoices</u> marked received, approved for payment, with date received, category and funding source charged to, date of payment, or <u>copy of check</u>. Written justification and <u>calculation worksheets</u> must be available for costs <u>allocated</u> between two or more funding sources.</p> <p><u>Procurement records and procedures</u> must be available for on-site and desk reviews.</p> <p>All CRP purchased <u>equipment</u> will be available for <u>inspection</u> during compliance monitoring.</p> <p>Planning Agencies should contact the project manager for <u>disposition instructions</u> when equipment needs to be replaced or is no longer needed for the program.</p>
<p>Contractual: Costs include those services or consulting that are provided by a firm or individual, not employed by the Planning Agency, and are not covered under the “Other” category.</p>	<p>REFERENCES UGMS <u>Part II</u>, Att A, Section B (22) CRP Contract Costs & Payments 1.12 <u>and</u> 2.16 CRP Contract General Conditions 2.18, 4.1-4.12 <u>and</u> 8.3 State of Texas Contract Management Guide</p>
<p>QUARTERLY TCEQ-20248-3 listing all subcontractor costs either incurred or paid during the period, including: - contractor name; - description of activities performed; - date(s) performed; - cost; and - task correlation.</p> <p>If costs are documented by more than one invoice for a contractor (e.g. monthly), list them separately. The project manager may request additional supporting documentation, including documentation of procurement, to verify allowability of costs.</p>	<p>SITE VISIT or DESK REVIEW <u>Subcontracts</u> or <u>purchase orders</u>, and vendor-submitted <u>invoices</u> marked received, approved for payment, with date received, category and funding source charged to, date of payment, or <u>copy of check</u>. <u>Procurement records</u>, including <u>solicitations</u> and <u>selection</u> documentation, and <u>procurement procedures</u> must be available for on-site and desk reviews.</p> <p>The Planning Agency is responsible for ensuring its subcontractor(s) maintain and submit all reimbursement documentation required for financial monitoring and/or audit. Subcontractors’ documentation must be available for on-site and desk reviews and upon request by the TCEQ staff. The Planning Agency must monitor its subcontractors to ensure they stay within the determined budget, all work is performed on time, & that quality deliverables are received.</p>



**Budget Categories and Documentation Required
to Process Reimbursement Requests - Exhibit 1B (cont'd.)**

<p>Indirect Costs: Costs incurred for a common or joint purpose benefitting more than one cost objective and not readily assignable to the cost objectives specifically benefitted without effort disproportionate to the results achieved.</p>	<p>REFERENCES UGMS <u>Part II</u>, Att A, Sections F, G, H and Att E CRP Contract Authorized Expense Budget 1.1 <u>and</u> 1.3 CRP Contract Costs & Payments 1.13 CRP Contract General Conditions 2.25</p>
<p>QUARTERLY Financial Status Report (TCEQ-20248) line “j” specifying the authorized rate and including a total cost not exceeding the rate authorized in the contract.</p>	<p>SITE VISIT or DESK REVIEW Option 1: <u>Approved rate agreement</u> from the federal cognizant agency or state coordinating agency, or independent <u>audit</u> which specifically examined indirect costs, & subsidiary worksheets & supporting documentation Option 2: <u>10%</u> of direct salaries (excluding fringe). No supporting documentation is required Option 3: No indirect costs, direct bill all costs</p>



Exhibit 1C

Excerpts from State of Texas Contract Management Guide



EXHIBIT 1C
Excerpts from State of Texas Contract Management Guide

Procurement Method	Use When	Advantages	Disadvantages
<p>Competitive Bids (Invitation for Bids)</p>	<p>Lots of competition exists.</p> <p>The product or service is available from more than one source.</p>	<p>Award process is simpler.</p> <p>Award is made to the lowest responsive, responsible bidder providing the best value to the State.</p>	<p>Defined specifications may be difficult to develop.</p> <p>Does not encourage innovative solutions.</p>
<p>Competitive Proposals (Request for Proposals, Request for Offer)</p>	<p>When factors other than price are evaluated.</p> <p>When negotiations are desired.</p> <p>Vendor is expected to provide innovative ideas.</p>	<p>Allows factors other than price to be considered.</p> <p>Allows for customized proposals suggesting different approaches to the same business need.</p> <p>Allows for negotiations in order to obtain the best value for the state.</p>	<p>Lead times for procurement are much greater.</p> <p>Evaluations are more complex and subjective.</p>
<p>Request for Information</p>	<p>There is insufficient information to write specifications for any procurement method.</p>	<p>Provides information to prepare a complete bid or proposal document.</p> <p>Allows the business community to have input into the agency's solicitation document based on current industry practices and market factors.</p> <p>Informs agency of any potential problems early in the procurement.</p>	<p>Lengthens the procurement process.</p>
<p>Request for Qualifications [This method is usually required by statute (e.g. Professional Services)]</p>	<p>Selection is made solely on the skills and qualifications of the contractor. Price is not a factor until after a vendor is selected.</p>	<p>Emphasizes the competency of the proposed contractors.</p>	<p>Contractor is selected before price is negotiated.</p>



Exhibit 1C contd.

Payment Type	Commonly used for:	Payment based on:
Cost Reimbursement	Client services contracts, usually associated with state and federal grants. Example: Contracts for services in remote areas.	Reimbursement of allowable costs. See the Uniform Grants Management Standards published by the Governor’s Office. (http://www.governor.state.tx.us/grants/what)
Cost Plus Incentives	Materials contracts wherein the materials are unknown at the time of contract award. Example: Construction contracts	Contractor’s cost plus a percentage of cost or cost plus a fixed fee. This type of payment is usually discouraged as there is no incentive for the contractor to minimize the cost to the State.
Fee For Service	Contracts wherein a fee can be established for a unit of service. Example: Providing flu shots to patients. Unit of service is one flu shot.	A specific fee for a unit of service. Payments are made for each unit of service completed.
Firm Fixed Price	Contracts wherein a firm fixed price can be established for work to be performed. Requires that the statement of work provide clear and accurate specifications. Example: Common goods and services such as office supplies, furniture, etc.	A firm fixed price at the time the contract is awarded. Contractor carries all risk as the payment does not change, regardless of how much it costs the contractor to provide the goods or services.
Firm Fixed Price with Escalator	Same as above and for longer term contracts and or contracts where the costs of material and labor are subject to market fluctuations. Because the contract allows for market adjustments, contractors are less likely to inflate prices to protect themselves against possible increases in operating costs. Example: Lumber, steel, paper	Same as above except includes a provision for price escalation. Escalators are typically based on the Consumer Price Index.
Progress	Construction contracts or contracts that are completed in phases or stages. Example: Building Construction, Consulting Services	Payment is based on pre-established deliverables. Deliverables must be measurable. <i>See note below.</i>
Time and Material	Labor contracts wherein the amount of labor or material required for the work cannot be forecast. Recommend other payment types if possible. For example – instead of paying the contractor \$25 per hour for labor plus the cost of the materials, establish pricing for common units of work such as “labor and material to install a 120 power outlet”. Example: Electrician, plumber, carpenter, etc.	Payment is based on the number of hours worked for a specific scope of work, i.e. install a 120 power outlet.

**Exhibit 1C contd.****The Contract Administration File**

Keeping one complete master contract administration file is critical. The file will provide a basis for settling claims and disputes should they arise in administrative or court actions. The TCEQ may request review of these items during contract fiscal monitoring desk reviews or site visits. Throughout the life of the contract, the contract administration file should contain such things as:

- A copy of the current contract and all modifications;
- A copy of all specifications, drawings or manuals incorporated into the contract by reference;
- A reference list or a list of prior contracts with this specific vendor (if they offer valuable historical data);
- The solicitation document, the contractor's response, evaluation determination, and the notice of award document;
- A list of contractor submittal requirements;
- A list of government furnished property or services;
- A list of all information furnished to the contractor;
- A copy of the pre-award conference summary, if conducted;
- A schedule of compliance review, internal correspondence, if applicable;
- A copy of all general correspondence related to the contract;
- The originals of all contractor data or report submittals;
- A copy of all routine reports required by the contract such as sales reports, pricing schedules, approval requests, and inspection reports;
- A copy of all notices to proceed, to stop work, to correct deficiencies, or change orders;
- A copy of all letters of approval pertaining to such matters as materials, the contractor's quality control program, prospective employees, and work schedules;
- The records/minutes of all meetings, both internal and external. Include sign-in sheets and/or agendas;
- A copy of all contractor invoices, information relative to discount provisions for prompt payment, letters pertaining to contract deductions or fee adjustments;
- A copy of all backup documentation for contractor payment or progress payment; and copies of any audits.



Exhibit 1D

Progress Report Format



**EXHIBIT 1D
PROGRESS REPORT FORMAT
DELIVERABLE STATUS***

FY 08 Quarter 1, September 1, 2007 through November 30, 2007

Task	Task Description	Date Due	Date Submitted	Comments
2A	Basin-wide QAPP Receipt and Commitment Letters	10/15/07	10/15/07	Three of three QAPP participants signed letters and these were faxed to TCEQ.
2B	Specified sections of the Basin-wide QAPP posted to the Web	10/31/07	10/31/07	Copy of updated webpages sent via email to TCEQ.
5A	Preparation Meeting for Basin Summary Report	11/01/07	10/20/07	Meeting held at TCEQ offices in Austin.
6A	Questionnaire for Steering Committee Mtg.	11/15/07	11/15/07	Copy of questionnaire was submitted to the TCEQ via email for review and comment prior to sending to steering committee members.
6A	Contact Steering Committee members to promote/confirm participation and review response against Membership Guidelines	11/30/07	11/15/07	Will follow-up on those that do not respond within 30 days.
6B	Develop Web site as outlined in the Web Site Requirements	11/30/07	11/30/07	Provided copies of web pages to TCEQ for review and comment.
1A	Progress Report	12/15/07	12/15/07	Submitted in spreadsheet by email attachment. Hard copy sent via mail.
3A	Monitoring Status Report	12/15/07	12/15/07	See the Progress Report.
6C	Maintain web site and provide summary of updates and/or copies of revised pages	with PRpt	12/15/07	Summary of updates provided to TCEQ, attached to Progress Report.
6I	Public Participation & Outreach Activities	with PRpt	12/15/07	No activity this quarter.
6J	Volunteer Monitoring Activities	with PRpt	12/15/07	Supported volunteer group.

*** An electronic spreadsheet of this document will be required to be submitted with the final work plan.**



**PROGRESS REPORT FORMAT
DESCRIPTION OF ACTIVITIES**

A River Authority of Texas

Clean Rivers Program Contract No. **582-6-12345**

FY 08 Quarter 1, September 1, 2007 through November 30, 2007

Describe CRP activities conducted for each Task in the current quarter. This information will be used to explain and justify expenses incurred on the reimbursement request.

TASK	DESCRIPTION OF ACTIVITIES
1.0 Administration	Met with CRP Project Manager on November 10 th to review status of contract deliverables
2.0 Quality Assurance	Cadmium data for 2nd quarter sampling not reportable from station 15833 due to holding time violation. Corrective action report provided. Data from LIMS was reviewed against field data sheets for data entry and reasonableness errors once a week throughout the quarter.
3.0 Water Quality Monitoring	Could not sample Flash Flood Creek in May due to dangerous weather conditions and stream bank erosion. See attached detail sheet showing the number of sites visited and the types of samples collected throughout the quarter.
4.0 Data Management	Data management personnel entered data into the database, reviewed data for entry errors, and conducted final data formatting in preparation for upcoming data submittal deliverable.
5.0 Data Analysis and Reporting	Collected all the data and information to begin data analysis for the Basin Summary Report. Reviewed Task 5 and developed a scenario for conducting the data review and report format. Met with CRP Project Manager on October 20 th to receive input on preparation of the Basin Summary Report.
6.0 Stakeholder Participation and Public Outreach	Prepared and mailed-out a questionnaire requesting input on agenda topics for upcoming Steering Committee Meeting. Contacted five representatives from Steering Committee list to request their attendance, ask for additional potential attendees, and obtain input on any presentations or presenters that would be helpful.
7.0 Special Projects	No activity this quarter.



**PROGRESS REPORT FORMAT
MONITORING ACTIVITIES**

FY 08 Quarter 1, September 1, 2007 through November 30, 2007

MONITORING TYPE	MONTH	MONITORING EVENT DESCRIPTION	PARAMETERS MONITORED
ROUTINE	September	5 sites in Lower River Watershed	field, conventional, bacteria, flow was collected at 3 sites, other two have USGS gages
	November	7 sites in Middle River Watershed	field, flow (at four sites, other 3 were reservoirs), conventional, bacteria, metals in water and metals in sediment at 2 sites
SYSTEMATIC	October	2 systematic sites in Clear Creek watershed	field with flow, conventional, bacteria
	November	3 systematic sites in Silty Creek watershed	field with flow, conventional, bacteria
PERMIT SUPPORT	September	Receiving Water Assessment, City of Here, Permit No.#####-###	fish, benthics, habitat, field, flow, conventional, 24 Hr DO
	September	Monthly Flow, City of Here, Permit No.#####-###	instantaneous flow
	October	Monthly Flow, City of Here, Permit No.#####-###	instantaneous flow
	November	Monthly Flow, City of Here, Permit No.#####-###	instantaneous flow
SPECIAL STUDY	November	Wetland Bayou Study	field, flow, hardness, metals in water and sediment (Cd, Zn, Pb)



Exhibit 1E

Budget Revision Form



EXHIBIT 1E BUDGET REVISION REQUEST FORM

Purpose: For TCEQ review and approval of recipient organization proposed budget changes to ensure project deliverables are met and fiscal accountability.

Instructions: Complete 1. - 7. Enter the amount of the change or amendment on the appropriate line(s) in Column "8". Add each line entry in Column "7" to the line entry in Column "8". The amounts in Column "9" represent the new or revised budget line items. **Justification:** Provide a reason for each line item change (e.g., placement of expenses in appropriate category. Budget estimate insufficient to meet project deliverables, etc.)

**Moving funds between budget categories that cumulatively equal greater than 10% is considered a major change, and will require sign-off from the CRP Program Manager and the Planning Agency's authorized representative.

1. RECIPIENT ORGANIZATION: (NAME & COMPLETE ADDRESS INCLUDING ZIP CODE):			
2. GRANT/CONTRACT TITLE:		3. PAYEE IDENTIFICATION NUMBER:	
4. TCEQ CONTRACT NUMBER:		5. TOTAL PROJECT/GRANT PERIOD:	
6. BUDGET CATEGORIES:	7. Approved Budget	8. Change Requested (+ or -)	9. New or Revised Budget
a. Personnel/Salaries			
b. Fringe Benefits			
c. Travel			
d. Supplies			
e. Equipment			
f. Contractual			
g. Construction			
h. Other			
I. Total Direct Costs (Sum a - h)			
j. Indirect Costs			
k. Total (Sum I & j)			
Justification: (Attach additional sheets, if necessary)			

Signature of Authorized Certifying Official

Signature of TCEQ Representative

Typed or Printed Name and Title

Typed or Printed Name and Title



Exhibit 1F

Contractor Evaluation Report



EXHIBIT 1F CONTRACTOR'S PERFORMANCE EVALUATION REPORT

_____ Final Report (Check only if the contract has ended and this is the last Performance Report)

Today's Date: _____ Evaluation Period: From _____ to _____ Report No. _____ of _____

Contractor: _____ Contract No./Purchase Order No.: _____

Project Name (if applicable): _____ Phase (if applicable): _____

Date of Last Report: _____ Date of Program's Last Site Visit: _____

Brief Description of Work: _____

Performance Category	Ratings				Comments
	<u>Exceeds Expectations</u> Score = 3	<u>Satisfactory Performance</u> Score = 2	<u>Marginal Performance</u> Score = 1	<u>Unsatisfactory Performance</u> Score = 0	
<i>Quality & Accuracy of the Work</i>					Please provide a narrative description for ratings of one or below (attachments are acceptable).
<i>Timeliness of the Work</i>					
<i>Financial & Progress Reports</i>					
<i>HUB</i>					
<i>Communication</i>					
<i>Cost Control</i>					
<i>Technology</i>					
<i>Other (describe)*</i>					

Evaluator's Name: _____ Signature: _____

Division: _____ Section: _____

**Requires an attachment describing category and rating description which corresponds.*

Note: Please see specific definitions for each performance category and an explanation for each score on following page.



CONTRACTOR’S PERFORMANCE EVALUATION REPORT - CATEGORY DESCRIPTIONS

EXHIBIT 1F CONTD.

PERFORMANCE CATEGORY	<u>EXCEEDS EXPECTATIONS</u> (Score = 3)	<u>SATISFACTORY PERFORMANCE</u> (Score = 2)	<u>MARGINAL PERFORMANCE</u> (Score = 1)	<u>UNSATISFACTORY PERFORMANCE</u> (Score = 0)
1. <u>Quality and Accuracy</u> Quality, sufficiency, and accuracy of contract-required work, including work or tasks performed by subcontractors	Work product always, with rare exceptions, of excellent quality. No revisions required.	Work product of satisfactory quality with only typical errors and omissions, which were corrected upon request.	Work product is acceptable, although many errors and/or omissions had to be corrected prior to product being acceptable.	Work product not acceptable or of very low quality, with many errors and omissions noted. Not all errors and omissions corrected.
2. <u>Timeliness</u> Timeliness with respect to completing contract-required work and/or work-related tasks, including work performed by subcontractors	All tasks and contract deliverables on time or ahead of schedule. Quality of work did not suffer as a result of the time line.	Some intermediate task delays, not expected to cause major deadlines to be missed or to require contract extension. Prior approval granted for any other delays.	Some major work performance delays caused (or expected to cause) delivery schedules to be missed.	Required work product not completed on time, due to factors that should have been under contractor’s control.
3. <u>Reports</u> Accuracy, adequacy, and timeliness of contract-required activity/progress reports, notifications, financial reports, invoices, pay requests and other required documents, excluding HUB reports	All reports accurate and complete, as well as on time. No rewrites or additional information required.	Reports satisfactory with respect to both quality and timeliness. Contractor responded quickly and appropriately to questions or comments raised.	Numerous errors and/or omissions corrected prior to reports being acceptable (or reminders of reports due were required to be sent). Reports not later than 5 working days.	Reports consistently of poor quality and/or late. Contents inadequate to permit interpretation or analysis. Reports more than 5 working days late.
4. <u>HUB</u> Contractor’s achievement of (or continued responsiveness toward) contract-contained HUB subcontracting goals and/or Good Faith Effort (GFE) requirements, including timely and accurate submittal of contract-required HUB-related reports	Prime consistently meets or exceeds (and has adequately documented) the HUB goals established in contract, or consistently meets and documents HUB GFE requirements.	Contractor’s HUB/GFE activities satisfactory, although not all goals achieved or reported in a timely manner.	Reports either not received on time, or have lacked information necessary to fully document GFE or other HUB subcontracting commitments.	Contractor did not meet (or did not document) the HUB goals established in the contract.
5. <u>Communication</u> Contractor’s accessibility, responsiveness, and cooperativeness with respect to any contract-related concerns communicated by the Contract Manager; plus contractor’s demonstrated relationship with subcontractors	Contractor consistently maintains excellent standing with subcontractors, including timely payments. Works as a team member and is flexible and responsive to changes in circumstances or scope of work.	Contractor is usually flexible and responsive to changes in circumstances or scope of work. Generally maintains good standing with subs, and ensures that they are paid promptly.	Contractor is only intermittently responsive to changes in contract scope or other circumstances. Marginal team player. Failed to make timely payments to subs on one or two occasions.	Not flexible to changes in scope or other circumstances. Not cooperative or accessible. Failed to maintain good standing with subs and failed to make payments on more than two occasions.
6. <u>Cost Control</u> Contractor’s cost control effectiveness and/or budget management skills	Contract performed at or below allowed cost, with no loss of quality.	Contract performed at less than 5% above allowed cost with adequate quality	Contract performed at 5 - 10% above allowed cost.	Contract performed at >10% above allowed cost.
7. <u>Technology</u> Contractor’s demonstrated technical competence and/or expertise (including competence and expertise of subcontractors); plus contractor’s innovativeness and willingness to apply, within the limitations of the contract, new techniques or technologies	Contractor is comfortable with and applies current proven technology. But is familiar with, and willing to use, latest techniques and solutions where such are appropriate.	Contractor is capable of applying current proven technology. Is aware of, but not experienced in the use of latest techniques and solutions.	Contractor usually uses more basic technology to solve contract problems. Is aware of, but has little or no experience in the use of more current proven techniques and solutions.	Contractor can only apply basic technology to tasks. Requires direction concerning appropriate technology and solutions.
8. <u>Other</u> DESCRIBE	DESCRIBE	DESCRIBE	DESCRIBE	DESCRIBE



Exhibit 1G

**Personnel Eligibility List
&
Fringe Benefits Methodology**



Exhibit 1H

Equipment Inventory Format



**EXHIBIT 1H
EQUIPMENT INVENTORY FORMAT**

Contract No.	Item Description	Serial No.	Item Amount	Date Purchased	Location	Working Condition	Comments
582-0-8141_	600 MHz Computer w/ CR-RW, 30 Gig HD, 19" Monitor	3493322	\$1450	05/01/00	Main Office Rm 201	Good	Use as CRP GIS computer and as River Authority's data storage unit
582-2-8141_	Hydrolab	853-4762	\$8000	07/02/00	Upper Basin Field Office	Needs new membrane	For CRP use in lake monitoring
582-4-8141_	Automatic Sampler	001399	\$2500	08/21/00	Main Office Storage Room	Missing messenger	For CRP use
582-6-8141_	Flow Meter	388-SJ99	\$6500	11/14/00	Main Office Field Equipment Room	Good	For CRP use
582-6-4442_	GPS Unit	G7754-01	\$5000	10/15/01	Main Office Storage Room	Good	For CRP use and River Authority's use



Exhibit 1I

Procurement System Certification



**EXHIBIT 11
PROCUREMENT SYSTEM CERTIFICATION**

PROCUREMENT SYSTEM CERTIFICATION

APPLICANT'S NAME (Organization)		
APPLICANT'S ADDRESS		
SECTION I – INSTRUCTIONS		
The applicant must submit this certification prior to the procurement of sub-recipients or vendors. This document is a certification that the applicant will use procurement procedures which reflect applicable state and local laws and regulations as outlined in the Uniform Grant Management Standards (UGMS).		
SECTION II - CERTIFICATIONS		
A. I affirm that the applicant has within the past 2 years certified to TCEQ that its procurement system complies with applicable state and local laws and regulations as outlined in the Uniform Grant Management Standards (UGMS). The date of the last Procurement System Certification was:		MONTH/YEAR
B. I, as an authorized representative of the applicant, CERTIFY that the applicant's Procurement System meets all applicable state and local laws and regulations as outlined in the Uniform Grant Management Standards (UGMS).		
List the title and date of all applicable procurement system policy and/or procedure documents. These documents must be made available to the TCEQ upon request.		
PRINTED NAME & TITLE:	SIGNATURE:	DATE:

SECTION I - INSTRUCTIONS

The applicant must complete and submit a copy of this form prior to the procurement of subcontracts or vendors. If the applicant has certified its procurement process to TCEQ within the past 2 years and the system has not been substantially revised, complete Part A in Section II, then sign and date the form. If the system has not been certified within the past 2 years, complete Part B, then sign and date the form and send to the appropriate TCEQ Project Manager at: TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, CLEAN RIVERS PROGRAM, MC 234, P.O. BOX 13087, AUSTIN, TX 78711-3087.



TASK 2: QUALITY ASSURANCE

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See CRP web site for QAPP Shell and related documents at www.texascleanrivers.org select *Program Resources* then *Quality Assurance*

TASK 2: QUALITY ASSURANCE

Introduction

Quality assurance (QA) is an integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure a process is of the type and quality needed and expected by the customer. The focus on this definition provides this task's rationale as it relates to project planning, oversight, and corrective action.

Systematic project planning is central to an integrated quality assurance approach and is fundamental to the success of water quality monitoring projects conducted under the Clean Rivers Program (CRP). It is a process that considers:

- project objectives
- measurement performance specifications
- appropriate methods
- field and laboratory quality control
- data management
- verification and validation of data
- oversight
- corrective action

Quality Assurance Project Plans (QAPPs) will continue to be used by the CRP to plan, organize, and define its quality assurance process in order for data to be collected with the level of reliability needed for decision-making. Although QAPPs for the CRP do not require Environmental Protection Agency (EPA) approval, the Texas Commission on Environmental Quality (TCEQ) requires that data collection under the CRP be comparable to other data collected by the TCEQ and be consistent with EPA requirements.

Oversight of data collection activities is a key component of quality assurance. Appropriate and well-timed oversight of projects -in the form of on-site visits - is essential to ensure that all sections of the quality system and the QAPP are conducted as prescribed. Also paramount to success is ensuring that corrective actions are identified, implemented in a timely manner, documented, monitored, and verified. Also, very important, is a good and effective system for data review. These activities will continue to be emphasized during the FY 2010-2011 biennium.

The TCEQ recognizes that the NELAC accreditation process is labor and resource intensive. Additional costs associated with NELAC as they relate to the CRP may be charged directly or indirectly to the program, but must be fully explained and justified in the workplan and include deliverables. Laboratories should be working towards incorporating costs associated with accreditation into their rate schedules, so that in future contracts, additional costs to the CRP may be reflected in a per-analysis rate.

Contract Shell Provisions

Certain key components related to quality assurance are essential to the collection of valid data and ensure, to the greatest extent possible, that data produced by the CRP will be of the type and quality necessary for its intended use. These critical components represent the three key aspects of quality



assurance: planning, implementation, and oversight. Due to the significance of these factors, the following provisions have been incorporated into the CRP contract shell:

All work funded by this Agreement that involves the acquisition of environmental data generated from direct measurement activities, collected from other sources, or compiled from computerized data bases and information systems shall be planned in consultation with the TCEQ and be documented in a fully approved TCEQ Quality Assurance Project Plan (QAPP) before data collection can be implemented. If this Agreement contains Federal Conditions, the QAPP must be approved by the U.S. Environmental Protection Agency (EPA) Project Officer in compliance with the Federal Conditions of this Agreement.

The GRANTEE shall ensure laboratory data is produced by laboratories (and subcontract laboratories) that are National Environmental Laboratory Accreditation Conference (NELAC)-accredited according to Texas Water Code Chapter 5, Subchapter R (TWC §5.801 et seq) and Title 30 Texas Administrative Code Chapter 25, Subchapters A and B.

If this Agreement is funded pursuant to the Texas Clean Rivers Program, the GRANTEE must perform on-site assessments of field monitoring activities for all sub-participants and/or subcontractors at least once during the Contract Term, for on-going projects, or once during the project's lifetime, for short-lived projects.

Project Planning

Special study and permit support monitoring projects to be conducted during FY 2010-2011 should be thoroughly discussed with TCEQ staff and all applicable parties before the work plan is finalized. If Basin Planning Agencies intend to conduct multiple special projects under subcontract, they should carefully consider staggering projects over the biennium, with consideration of variable funding. Sufficient time should be allocated to properly plan and execute the QAPP prior to data collection and reporting. Certain projects (or components of projects such as report writing) can be carried into the subsequent biennium to allow for adequate data collection. This should be determined prior to the execution of the work plan.

A formal project planning process has many benefits:

- It optimizes data collection efforts by promoting communication and input from all involved parties.
- It ensures that data collected are of the type and quality appropriate to their intended use; and therefore, support decision making.
- It maximizes the use of existing data.
- Conditions for data management will be specified, such as data coding, verification and validation, manipulation, and transfer.
- Agreements reached during the process will determine the information to be documented in the QAPP appendix, expediting review and approval so projects can begin in a timely manner.

Basin Planning Agency Project Managers should contact their CRP Project Managers to indicate their intent and desire to conduct a planning meeting. A planning meeting should be conducted 90 days prior to the planned sampling date. After a date has been agreed upon, the CRP Project Manager will make the Agency contacts.

The objective of the project planning meeting is to implement a systematic planning process based on the Sections of the QAPP. The information developed during the planning meeting will be incorporated into a QAPP.



The Basin Planning Agency Project Manager will play the lead role in respect to planning projects and will:

- establish the planning team in consultation with the TCEQ
- schedule meetings
- distribute meeting materials in advance of the meeting
- facilitate the meetings
- prepare meeting minutes

Meeting preparation materials should include a proposed scope of work (**Do not begin drafting the QAPP until after the meeting**). Meetings may be conducted in Austin, at the Basin Planning Agency, or via conference call, and will usually take 1-2 hours. The outcome of the planning meeting should be a set project goal and objectives along with an idea of how the data should be coded for entry into SWQMIS. A QAPP should be developed within 30 days after the meeting. The detailed meeting minutes serve as the deliverable for this task.

Approval to Conduct Work

As stated in the contract, all work funded by the contract that involves the acquisition of environmental data generated from direct measurement activities, collected from other sources, or compiled from computerized data bases and information systems shall be implemented in accordance with an approved QAPP except under limited conditions described below.

Lapses in Basin-wide QAPP coverage sometimes occur due to time constraints in getting updated QAPPs fully approved and distributed at the beginning of a new two-year contract cycle. When a QAPP is due to expire, if no changes are being made to the next QAPP other than to the monitoring schedule, and the new monitoring schedule has already been approved, then the Basin Planning Agency may request authorization to proceed with the monitoring plan conditionally under the existing QAPP until the new QAPP is approved and distributed.

To obtain conditional approval, the Basin Planning Agency Project Manager must submit an e-mail request to the CRP Project Manager prior to the expiration date of the existing QAPP. The CRP Project Manager, with the concurrence of the TCEQ CRP Program Manager and the Lead Quality Assurance Specialist (QAS) may grant approval for a maximum of 90 days beyond the expiration date of the existing QAPP.

Project Oversight

In order to ensure that data collection is conducted as planned and environmental monitoring projects are successful, a process of oversight and evaluation is necessary. Adequate oversight and evaluation of projects ensure that:

- work is accomplished as planned
- data quality is adequate
- corrective actions, when needed, are implemented effectively

Project oversight requirements should be documented in Section C1, Assessment and Response Actions, of the QAPP.



Basin Planning Agency Oversight Requirements

Basin Planning Agencies are required to oversee the activities addressed in their QAPPs and must conduct formal oversight of all sub-participants who conduct field monitoring.

Two types of field monitoring oversight are acceptable: 1) readiness reviews and 2) monitoring systems audits. Both of these activities should be performed on-site at least once during the contract cycle in the case of on-going projects, or once during a project's lifetime in the case of short-lived special studies. (This requirement does not apply if all work is performed by the Basin Planning Agency.) The type and timing of oversight activities will be negotiated during project planning and will be documented in the QAPP.

Basin Planning Agencies are also tasked with conducting status monitoring which involves the continual evaluation of programs or projects to ensure they are being conducted as planned and documented. Oversight activities are described in the following sections.

Readiness Review

A readiness review involves an evaluation to determine if all components of the project are in place so that work can begin. Readiness reviews are the preferred type of assessment activity to detect deficiencies so that corrective actions can be taken prior to initiation of data collection activities. The process is designed to evaluate the performance or effectiveness of the sampling process from collection through final reporting of the results, including (as applicable):

- required documentation
- adequacy of facilities and equipment
- instrument calibration procedures and logs
- field measurement protocols
- sample collection protocols
- biological sampling protocols
- sample handling and analysis protocols
- data verification and validation protocols and records
- data management protocols

The Monitoring Systems Audit Checklist is available electronically on the CRP web page at www.texascleanrivers.org in the *Program Resources* --> *Quality Assurance* section. The checklist should be modified to accommodate a readiness review. To conduct a readiness review, the reviewer must be familiar with the QAPP, field standard operating procedures, and data management protocols.

Monitoring Systems Audit

A monitoring systems audit is a thorough and systematic technical systems audit which involves an on-site qualitative review of activities related to monitoring and during which facilities, equipment, personnel, training procedures, and record keeping are examined for conformance to the requirements of the QAPP. The goal of a monitoring systems audit is to detect deficiencies so that corrective actions can be taken. The audit process is designed to evaluate the sampling process from collection through final reporting of the results to include the same types of activities/processes looked at during a readiness review and can be performed at any time during the lifetime of a monitoring program or project.



The Planning Agencies are tasked with ensuring that any laboratory generating data for the CRP is audited by its laboratory quality assurance staff for conformance to laboratory SOPs, applicable methods, and other specific requirements defined in the applicable QAPP and in its quality system standard. Planning Agencies are also tasked with confirming that Management System Reviews (MSRs) are conducted to assess the laboratory's internal management structure and related documentation to determine whether the laboratory is implementing a satisfactory QA program. MSRs are used to determine the effectiveness of and adherence to the QA program, and the adequacy of resources and personnel provided to achieve the required data quality. Internal laboratory audits and MSRs are performed periodically and according to a predetermined schedule.

The Monitoring Systems Audit Checklist is accessible electronically, see link in paragraph above. The checklist should be adapted as necessary based on the audit scope.

Report and Response

Following either a readiness review or a monitoring systems audit, the auditor must provide the audited organization with a report within 30 days. If no deficiencies are identified, then the report should state such. If deficiencies are identified, they must be reported as "findings" in the report. Audit reports should reference specific requirement(s) in the QAPP or in SOPs and should not be general in nature. Additional information regarding the justification of findings may be included. The audited organization should be asked to respond to the report in writing within 30 days regarding:

- the root cause of the deficiency
- the effect, if any, on any previously completed or current work
- proposed corrective action(s) to correct the deficiency
- action(s) planned to prevent recurrence of the deficiency
- date that each action will be, or was completed

A copy of the audit report and the response must be submitted as a deliverable to the CRP Project Manager with the progress report no later than the quarter following the one in which the audit was conducted.

Status Monitoring

Status monitoring involves the continual evaluation of programs or projects to ensure they are being conducted as planned and documented in the QAPP. This type of oversight is specified in the QAPP to ensure that CRP Project Managers perform a continual review of quality assurance activities over the course of the biennium. This type of monitoring may be a formal management review or a less formal review of QA activities. At a minimum, the Planning Agency Project Manager should request a written status of QA activities from staff on a quarterly basis. This includes, but is not limited to Laboratory NELAC Accreditation Status, Deficiencies, and Corrective Actions.

Corrective Action Process for Deficiencies

Planning Agencies are asked to address issues that may affect data quality. Definitions are in place to help Planning Agencies track, address, and report issues effectively without imposing unnecessary requirements.

Any deviation from the QAPP, SWQM Procedures Manual, SOPs, or Data Management Reference Guide is a deficiency. Deficiencies may invalidate resulting data and may require corrective action. Corrective action may involve discarding samples and collecting replacement samples. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff. It is the responsibility of the Submitting Entity Project Manager, in consultation with the Submitting Entity QAO, to ensure



that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the CRP Project Manager both verbally and in writing in the project progress reports and by completion of a corrective action plan (CAP).

Planning Agencies must address deficiencies associated with:

- sampling method or design (e.g. samples not preserved in the field)
- sample tracking procedures (e.g. hold times for bacteria samples expired; bacteria samples not collected in sterile bottles)
- analytical method requirements (e.g. post calibrations not performed)
- quality control requirements or acceptability requirements (e.g. blank contamination)

Corrective Action Plans should:

- Identify the problem
- Identify immediate remedial actions if possible
- Identify the underlying cause(s) of the problem
- Identify whether the problem is likely to recur, or occur in other areas
- Evaluate the need for Corrective Action
- Use problem-solving techniques to verify causes, determine solution, and develop an action plan
- Identify personnel responsible for action
- Establish timelines and provide a schedule
- Document the corrective action

To facilitate the process a flow chart has been developed (See Exhibit 2A: Corrective Action Process for Deficiencies).

The status of CAPs will be included in quarterly progress reports (see Exhibit 2B: Status of Corrective Actions Table). Deficiencies should also be communicated on Data Summaries. A form has been developed for the Planning Agencies to document corrective actions. The form can be accessed electronically at (www.texascleanrivers.org select *Program Resources* then *Quality Assurance*) and in Exhibit 2C of this document. Planning Agencies may choose to use the forms provided or devise their own system and set of forms.

After Corrective Actions have been completed, these follow-up activities should occur at the Planning Agency

- Status monitoring
- Periodic review of documentation about the corrective actions
- Determining the effectiveness of the corrective actions

Data Review, Verification, and Validation

A good, well-defined, documented system of data review is very important to ensure the validity of data that are submitted to the TCEQ. This activity has been emphasized in past Guidance documents and will continue to be emphasized during the FY 2010-2011 biennium. For the purpose of reviewing data, the CRP will continue to define and recognize the two terms **verification** and **validation** as they are part of NELAC terminology. Verification is confirmation by examination and provision of evidence that specified requirements have been met. It refers to the data review processes used to determine data completeness, correctness, and compliance with technical specifications contained in applicable documents (e.g. QAPPs, SOPs, QAMs, analytical methods, NELAC Accreditation). Validation is the



confirmation by examination and provision of objective evidence that the particular requirement for a specific intended use is fulfilled. It refers to a specific review process that extends the evaluation of a data set beyond method and procedural compliance (i.e., data verification) to determine the quality of a data set specific to its intended use.

All data obtained from field and laboratory measurements must be reviewed and verified for conformance to technical criteria and then validated against performance specifications and/or DQOs. Only those data which are properly supported by appropriate QC data and which meet applicable project specifications and/or DQOs will be considered acceptable for reporting to the TCEQ for entry into the SWQMIS.

The Planning Agency will delineate the specifics of data review in Section D1 of the QAPP and specify responsible parties. Generally speaking, there are levels of review to be performed by field staff and by laboratory staff. The field data review tasks are usually performed by field staff and the laboratory data review tasks are usually performed by laboratory staff. The rest of the tasks are performed after the field and laboratory data are combined into a data set and depending on the situation are performed initially by sub-participant Data Managers or QAOs, and then by the Planning Agency Data Managers or QAOs.

To facilitate the review of data by the various parties, it is helpful to develop and use checklists that address the various levels of review (see Table 1: Verification and Validation Tasks). Checklists should be developed for the review of field data that incorporate the various requirements defined in the *Surface Water Quality Monitoring Procedures (RG-415)* and in the QAPP so that the data review tasks associated with field data can be accomplished. Likewise, checklists should be developed for the review of lab data. Similarly, the Planning Agency should prepare a checklist for use in reviewing the data after the data set is assembled that speaks to the usability of the data.

If any requirements or specifications of the CRP are not met, based on any part of the data review, the responsible party should document the deficiencies and submit the information to the Planning Agency with the data. In turn, this information must be communicated to the TCEQ by the Planning Agency in the Data Summary.



Table 1: Verification and Validation Tasks

Task	Field Task	Laboratory Task	Submitting Entity Data Manager Task
Sample documentation complete; samples labeled, sites identified	✓	✓	
Field QC samples collected for all analytes as prescribed in the TCEQ <i>SWQM Procedures Manual</i>	✓		
Standards and reagents traceable	✓	✓	
Chain of custody complete/acceptable	✓	✓	
NELAC Accreditation is current		✓	✓
Sample preservation and handling acceptable	✓	✓	
Holding times not exceeded	✓	✓	
Collection, preparation, and analysis consistent with SOPs and QAPP	✓	✓	✓
Field documentation (e.g., biological, stream habitat) complete	✓		
Instrument calibration data complete	✓	✓	
Bacteriological records complete	✓	✓	
QC samples analyzed at required frequency	✓	✓	✓
QC results meet performance and program specifications	✓	✓	✓
Analytical sensitivity (Limits of Quantitation/Ambient Water Reporting Limits) consistent with QAPP		✓	✓
Results, calculations, transcriptions checked	✓	✓	
Laboratory bench-level review performed		✓	
All laboratory samples analyzed for all parameters		✓	
Corollary data agree	✓	✓	✓
Nonconforming activities documented	✓	✓	✓
Outliers confirmed and documented; reasonableness check performed			✓
Dates formatted correctly			✓
Depth reported correctly			✓
TAG IDs correct			✓
TCEQ ID number assigned			✓
Valid parameter codes			✓
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			✓
Time based on 24-hour clock			✓
Absence of transcription error confirmed	✓	✓	✓
Absence of electronic errors confirmed	✓	✓	✓
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)	✓	✓	✓
Field QC results attached to data review checklist			✓
Verified data log submitted			✓
10% of data manually reviewed			✓



Aspects of data management such as formatting and report generation to facilitate “data validation” are discussed in Task 4.

TCEQ Oversight Requirements

TCEQ Laboratory and Monitoring Systems Audits

The TCEQ will continue to oversee Planning Agency activities by performing laboratory and monitoring systems audits of Planning Agencies as determined by a risk-based assessment.

Laboratory Audits of CRP participant laboratories are performed biennially by TCEQ Laboratory Inspectors. The audits assess compliance with NELAC standards, and include reviews of facilities, equipment, record-keeping, chain-of-custody records, adherence to approved QA planning documents, and SOPs. The CRP Project Manager, Project QA Specialist, and/or Lead QA Specialist may provide input into this process if deemed appropriate by the Laboratory Inspector. Checklists are used to guide the conduct of the audits.

The results of audits are documented in audit reports and sent to the auditees, CRP management, agency QA management and the appropriate Regional Director within 30 days of the site visits. If audits identify problems requiring corrective actions, the auditees provide written responses to the laboratory inspector addressing corrective actions within 30 days of receipt of the audit reports. Copies of laboratory inspection letters and audit reports are forwarded to the CRP Lead QA Specialist; auditee responses are sent to the CRP Lead QA Specialist upon request. Audit findings are reported to upper management (Section Manager and above) if significant corrective action is needed. Otherwise, audit reports are maintained by the QAWG which is a TCEQ quality assurance workgroup.

Monitoring Systems Audits conducted by the TCEQ will be determined after the FY 2009 risk assessment has been conducted and results ranked. Audits by the TCEQ will be conducted systematically so that all Planning Agencies and laboratories performing work for CRP will be assessed within a three-to-five year period, or more frequently, depending upon several factors (e.g., number of requests for audits, risk factors, findings from previous audits).

Specific CRP Laboratory Requirements

Ambient Water Reporting Limits (AWRLs)

For surface water to be evaluated for compliance with Texas Surface Water Quality Standards (TSWQS) (30 TAC §307.1 - 307.10) and screening levels, data must be reported at or **below** specified levels. To ensure data are collected at or below these levels, required reporting specifications (now known as AWRLs, but previously known as minimum analytical levels, or MALs) were established early in the CRP.

Many of the MALs were originally based on widely available analytical techniques and not necessarily on the data needs of the TCEQ’s surface water quality programs. A workgroup was established in the summer of 2001 to review the MALs to ensure reporting limit requirements were properly aligned with the TCEQ’s data needs. The term MAL was confusing for a variety of reasons so, as a first step, the workgroup adopted the term AWRL to more accurately reflect the process.

To set AWRLs appropriately, the workgroup first looked at how data would be compared against the TSWQSs. Ultimately, the lowest standard or screening level was used to set each AWRL. The



parameters for which AWRLs have been established are available electronically (see www.texascleanrivers.org and click on *Program Resources > Quality Assurance*).

While the AWRL is the program-defined reporting specification for each analyte, most laboratories report data based on the concept of a limit of quantitation (LOQ). A limit of quantitation (formerly known as Reporting Limit) is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The following requirements must be met in order to report results to the CRP:

- **The laboratory's LOQ for each analyte must be at or below the AWRL as a matter of routine practice**
- **The laboratory must demonstrate its ability to quantitate at its LOQ for each analyte by running an LOQ check standard for each analytical batch of CRP Samples analyzed. The requirements for lab control check standards are described in Section B5 of the QAPP shell.**

The laboratory should be instructed to analyze a calibration standard (if applicable) at the LOQ on each day CRP samples are analyzed. Two acceptance criteria **must** be met: (1) Calibrations (including the standard at the LOQ) must meet the calibration requirements of the analytical method, and (2) The laboratory will analyze an LOQ check standard **for each analytical batch of CRP samples analyzed.**

For certain parameters that are routinely reported close to the LOQ, LCS should be run at the LOQ. These parameters include nutrients and metals.

Authorized Laboratory Methods

Analytical methodologies under the CRP are specified in the TSWQS. The TSWQS mandate that procedures for laboratory analysis will be in accordance with:

- the most recently published edition of the book entitled *Standard Methods for the Examination of Water and Wastewater*
- the latest version of the *Surface Water Quality Monitoring Procedures (RG 415 and RG 416)*
- 40 Code of Federal Regulations (CFR) Part 136
- other reliable procedures acceptable to the Agency

Changes to 40 CFR §136 became effective March 12, 2007. These changes allow the use of 189 updated methods from the 19th and 20th editions of *Standard Methods* in addition to the methods approved earlier for use. Requirements for analytical methodologies are specified in the QAPP shell document.

Statistical Control of Precision and Bias

Analytical laboratories must have a statistical process in place to review results as applicable to control on-going performance. To generate data for the CRP, the laboratories' control limits must be set and controlled within the bounds set by the measurement performance specifications for laboratory control samples (LCS) and LCS/LCS duplicates as defined in Table A7 of the QAPP.

The most common method of statistical process control involves the use of control charts as described in *Standard Methods for the Examination of Water and Wastewater* or the *EPA Handbook*



for Analytical Quality Control in Water and Wastewater Laboratories. (Computer-generated lists or databases with values, limits, and trends may be used as an alternative to control charts.)

Laboratory Test Reports

Laboratory test reports (if applicable for routine water quality data analysis) should be clear, unambiguous and, at a minimum, contain the information specified in the NELAC Standards. The information required by NELAC with test results is required even if the data are transmitted from the laboratories in event result format unless the laboratory has valid reasons for not doing so. In addition to the specified information, test reports for the CRP should include project-specific quality control results such as results of equipment, trip, and field blank results, bacteria holding time, as applicable. It is important for laboratories to provide narrative information about why results were not compliant with specifications as stated in the "Laboratory Data Review" section. Without this information, Basin Planning Agency data management staff cannot verify and validate data and provide required information on the Data Summary when data are submitted to the TCEQ. Copies of test reports will be reviewed during monitoring systems audits. Information regarding standard test report format is contained in the QAPP shell document. Additional information may be requested.

Laboratory Data Review

The laboratory's role in the review of CRP data is very important. At a minimum, all laboratory data must be reviewed (as described under "**Data Review, Verification and Validation**" in this Task). Laboratories should have SOPs in place to ensure data are free from transcription and calculation errors, all quality control measures are reviewed and evaluated, and project specifications are met. Laboratory data review records must be signed and dated by the analyst reviewer(s) and/or the Laboratory QA Officer.

The use of data review checklists by the laboratory is encouraged. If any requirements or specifications are not met, based on the data review, the laboratory should document the nonconforming activities and submit the information in the report narrative to the Planning Agency with the data. In turn, this information must be communicated to the TCEQ by the Planning Agency in the Data Summary.

Quality Assurance Project Plans

The development and implementation of a QAPP help to ensure:

- all projects use a planned approach, and that objectives, roles, and responsibilities of the participants are defined
- all aspects of measurement systems are defined and appropriate
- project oversight is adequate
- data verification and validation procedures are specified, thus enabling reconciliation with data quality objectives

Shells have been provided for all CRP QAPP documents and can be accessed electronically (www.texascleanrivers.org select *Program Resources > Quality Assurance*). The use of shell documents has streamlined the CRP QAPP preparation, review, and approval processes.

Much of the shell language represents CRP and/or TCEQ requirements. Language in standard text format is provided as an example. The language should be modified to reflect **actual** activities. Please discuss changes with the TCEQ CRP Project Manager. Information to be provided by the



Planning Agency is provided in highlighted text. Italicized instructions are provided for the various sections and should be deleted from the document before it is submitted to the TCEQ.

The first draft of the QAPP should be submitted electronically. The TCEQ will send the first round of comments in a table. Responses to each TCEQ comment should be submitted noting how the comment was addressed in the column marked "Response". The review and approval of proposed revisions to the QAPP may be expedited if two versions of the document are submitted. One version should include highlights and strike-outs to show changes to the document, the other should have the highlights and strike-outs removed.

Biennial Submittal of Basin-Wide QAPPs

Draft basin-wide QAPPs should be sent electronically to the TCEQ CRP Project Manager on June 15 prior to the start of the new biennium. Review comments will be sent to the Planning Agency Project Manager within approximately 30 days of QAPP receipt. The Planning Agency must modify and resubmit the document within 30 days. The final basin-wide QAPP is due by August 15, 2009 for FY 2010/2011 and August 15, 2011 for FY 2012/2013.

Data Collection Procedures

The TCEQ *Surface Water Quality Monitoring Procedures Manual (RG-415 and RG-416)* (www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_procedures.html) describe field procedures used for surface water sampling and biological collection for the purpose of submitting data to TCEQ. The QAPP states that the most recent version of the *Surface Water Quality Monitoring Procedures* must be used, including any updates made between revisions. If other SOPs apply, they should be referenced in the QAPP, as appropriate. SOPs should not be submitted with the QAPP for TCEQ review (unless specifically requested) but should be available to sampling staff and accessible for review by TCEQ staff during an audit.

QAPP Maps

Maps must be included in the QAPP. QAPP maps need to include and label: sampling sites covered under the QAPP, streams/reservoirs, major roads, and cities.

Approval, Signature, and Distribution of Basin-Wide QAPPs

After the TCEQ has given verbal approval of the QAPP, **three** copies of the document should be signed by the Planning Agency based on the designated signatures on the QAPP shell and sent to the TCEQ for signature. An electronic copy of the QAPP should be submitted to the TCEQ CRP Project Manager in addition to the hard copies. The TCEQ will retain two signed copies of the QAPP. The Planning Agency may send additional signature pages it would like to be signed by the TCEQ, if necessary. We ask that you provide an electronic copy of the QAPP in case changes need to be made during sign off. A final copy will be uploaded to SWQMIS to be accessed by users in addition to the raw data.

Required signatures are designated on the Basin-wide QAPP shell document. In FY2008, the requirement for lab sign off on QAPPs was added to insure that laboratories were involved in the development of QAPPs. The Planning Agency must distribute the QAPP to all participants and sub-participants. (Note: The TCEQ Lead QA Specialist will distribute copies to the TCEQ personnel indicated on the distribution list.) The Planning Agency will secure a receipt and commitment letter from sub-participants of its QAPP stating the sub-participants' receipt of the document and commitment to requirements contained in the QAPP. An example letter is provided in the QAPP shell document. This QAPP documentation should be maintained as part of the project's quality assurance records. **Copies of all commitment letters must be forwarded to the TCEQ no later than 60 days**



of TCEQ approval of the QAPP but prior to the monitoring event. (Note: Commitment letters are not required for entities who sign off on the QAPP)

QAPP Appendices

Appendices are prepared to itemize additional work or projects not initially described in the original QAPP. The appendices are planned by Planning Agency Project Managers in coordination with TCEQ CRP Project Managers, the Project QA Specialist, the Lead QA Specialist and other technical specialists (laboratories, consultants, other agency water programs, etc.) as appropriate.

Special Study or Permit Support Monitoring

These QAPP appendices are designed to incorporate special study or permit support monitoring projects into the QAPP as they are planned. Although QAPP appendices are designed to be attachments to the basin-wide QAPP and reference applicable parts, they do need to have specific information addressed that is unique to a project such as: problem definition, task description, project objective, measurement performance specifications, sample design rationale, sampling methods requirements, data management, etc. There should be enough information provided in the QAPP appendix that it functions, for easy reference, like a stand-alone document. This information will be addressed during the project planning meeting.

QAPP appendices will be sent to the TCEQ CRP Project Manager, who will track the deliverables and forward them to the Lead QA Specialist for review. After the document has been reviewed by the TCEQ, comments will be compiled and sent to the Planning Agency through the TCEQ CRP Project Manager. The TCEQ is committed to an expeditious review and approval of these documents. Generally, they can be reviewed and approved within a short time frame if all issues discussed in the planning meeting are addressed properly.

Use and Qualification of Non-Measurement Data

Data which are not newly generated as part of a project are called "existing," "historical," or "non-measurement" data. For the purpose of routine data, Section B9 of the basin-wide QAPP shell document addresses non-measurement data and specifies, "this QAPP does not include the use of routine monitoring data obtained from non-measurement sources." Therefore, Planning Agencies should not request that historical routine data be submitted through the CRP.

However, in some cases, non-measurement data will be co-mingled with new data collected under a special project or permit support QAPP appendix. Acquiring non-measurement data can allow data needs to be met despite time and resource constraints. The use of non-measurement data may also provide more detailed and exhaustive information than the project could produce otherwise, allowing for a better understanding of the situation. Sources of non-measurement data include: other projects, databases, reports, etc. These non-measurement data must be qualified in Section B9 of the special study or permit support QAPP.

To qualify non-measurement data, the Planning Agency must consider and describe the following Sections of data collection:

- Quality Objectives and Criteria - The original purpose of the data and what QAPP the data were collected under (if applicable) and measurement performance specifications.
- Sampling and Process Design - Sampling locations, dates and times; limitations associated with the data and how these may impact their intended use relative to the project objectives
- Sampling Methods, Handling and Custody - Chain-of-custody procedures, sample preservation, holding times.



- Analytical Methods- Type of analytical equipment, maintenance, and calibration procedures; laboratory analyst training and capability; sample preparation and methods of analysis.

For the purpose of CRP projects, it is important to verify that data are consistent with TCEQ requirements and; therefore, comparable to other data, allowing for comparisons. To qualify non-measurement data, the Planning Agency must use whatever metadata are available and consider and describe all Sections of the QAPP, as applicable in Section B9. The EPA Guidance document *EPA QA/G-5* provides information regarding the qualification and use of existing data.

QAPP Amendments and Revisions to Appendices

Project changes (including changes to analytical procedures/changes to Table A.7, NELAC Accreditation, sampling sites and/or schedule, changes that would affect the data generated by the project, project organization, etc.) require amendments to the QAPP. QAPP amendments are contract deliverables and will be submitted to the TCEQ on an "as needed" basis. The Planning Agency must provide a justification and summary of the changes as specified in the QAPP amendment shell, as well as specific details related to the required QAPP Sections. The changes should not be implemented until the amendment is fully executed.

It is recognized that many QAPP amendments involve changes to address existing activities which have been consistent with program requirements all along and therefore correct information that was not included or was incorrect in the original QAPP. These amendments should not be "backdated."

To streamline the amendment/revision process, there is a procedure for electronic review and approval of QAPP amendments and revisions to appendices. The steps for the process are as follows:

- 1) The Planning Agency sends the TCEQ CRP Project Manager an e-mailed amendment.
- 2) TCEQ CRP Project Manager, Project QA Specialist, and Lead CRP QA Specialist review the amendment and provide comments to the Planning Agency Project Manager or indicate that amendment can be approved.
- 3) If an amendment is ready to be approved, the TCEQ Lead CRP QA Specialist initiates an e-mail "signature page" and sends the e-mail to all signatories: Planning Agency Project Manager and QAO, Laboratory Manager and QAO, TCEQ CRP Project Manager and Project QA Specialist.
- 4) Each signatory "replies to all" for the most recent email indicating approval, providing an email "trail" to show all approvals on a single email.

When the TCEQ Lead CRP QA Specialist receives the final signatures, s/he will put the TCEQ approval date on the cover of the final amendment and e-mail the completed signature page and amendment to the Planning Agency Project Manager or QAO, TCEQ Project Manager, and TCEQ DM&A.

As in the past, the Planning Agency will secure a commitment letter from sub-participants of its QAPP stating the sub-participants' commitment to requirements contained in the QAPP amendment. An example letter is provided in the QAPP shell document. QAPP commitment documentation should be maintained as part of the project's quality assurance records. **Copies of all commitment letters must be forwarded to the TCEQ no later than 60 days of TCEQ approval of the QAPP amendment or appendix revision but prior to the monitoring event.** (Note: Commitment letters are not required for entities who sign off on the QAPP)



QAPP Amendments must be distributed to all personnel on the distribution list maintained by the Planning Agency. (Note: The TCEQ Quality Assurance Work Group (QAWG) will distribute copies to TCEQ project participants, including but not limited to the TCEQ CRP Project Manager, DM&A staff, and the Houston Laboratory as appropriate).

Appendix B: Monitoring Schedule Update

Because the basin-wide QAPP has a two-year effective date, the monitoring schedule in Appendix B of the basin-wide QAPP will need to be updated for the second year of the biennium after the annual coordinated monitoring meeting. The update should include a summary of changes to the monitoring schedule and revised maps. Revisions to Appendix B should be submitted for review and approval by July 31, 2010, in the first year of the contract period.

Web Site Deliverable

Certain sections of QAPPs should be posted on the Planning Agency's CRP Web page to enable the public to know and understand the water quality monitoring that is being conducted in their basin. These sections include the monitoring program or project objectives, measurement performance specifications (i.e., Table A7), link to the coordinated monitoring schedule (CMS) website with disclaimer that states that the CMS includes stations monitored by other entities, and special study appendices. You may also include monitoring schedule and maps of sampling sites.

Quality Assurance Training

The CRP encourages all applicable Planning Agency personnel and in-kind contributors to obtain training on topics associated with those outlined in this task. This is especially critical to ensuring data is collected using TCEQ-approved policies and procedures. Special accommodations may need to be made to ensure in-kind contributors get an appropriate level and amount of training. All non-CRP training events require prior approval to be considered for reimbursement. All training will be itemized in Task 1 of the progress report and charged accordingly.



Exhibit 2A

Corrective Action Process Flow Chart

Corrective Action Process for Deficiencies

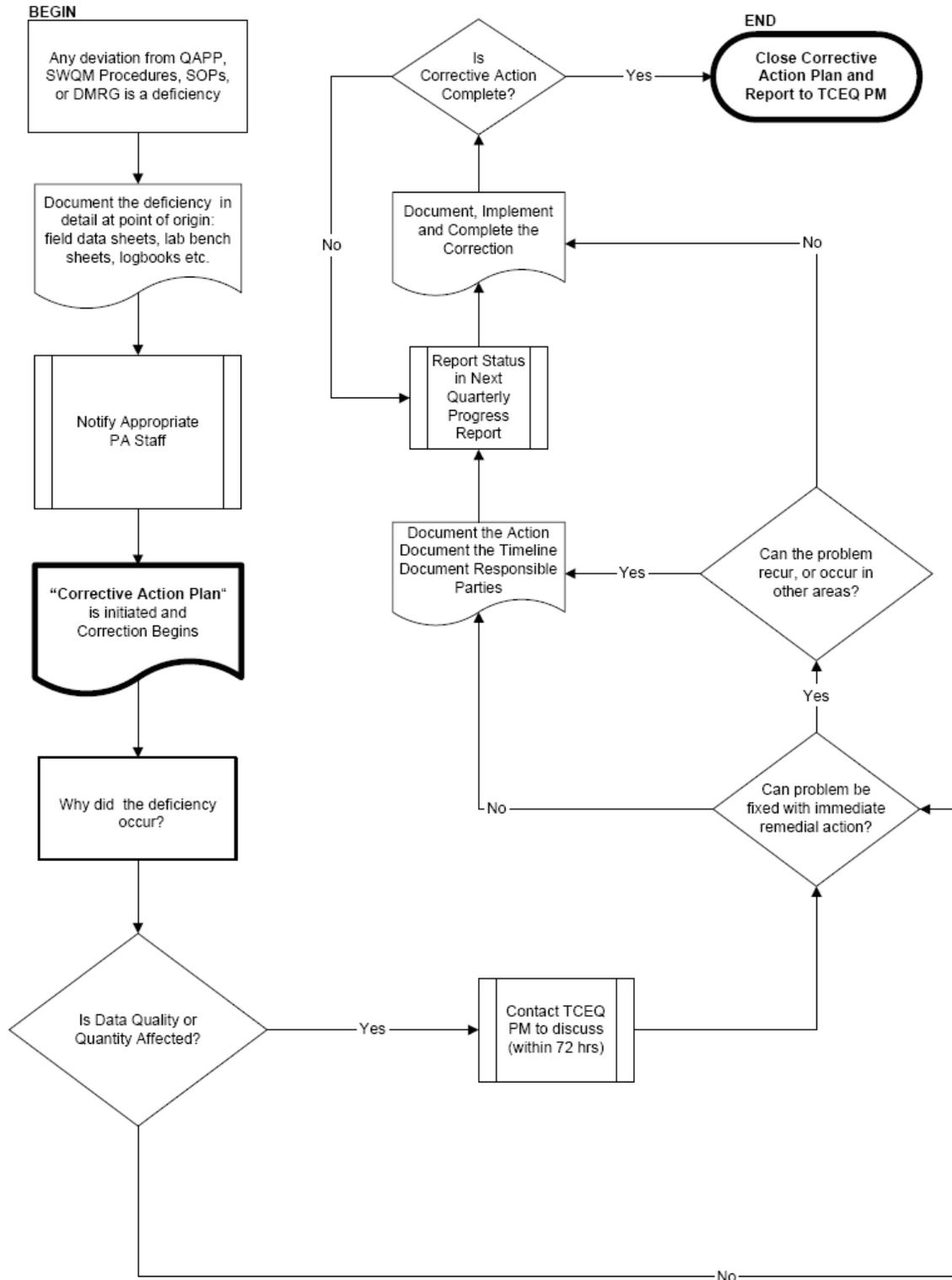




Exhibit 2B

Corrective Action Status Table



Exhibit 2C

Corrective Action Plan Form



Exhibit 2C - Corrective Action Plan Form

Corrective Action Plan
Issued by: _____ Date Issued _____ Report No. _____
Description of deficiency
Root Cause of deficiency
Programmatic Impact of deficiency
Does the seriousness of the deficiency require immediate reporting to the TCEQ? If so, when was it?
Corrective Action to address the deficiency and prevent its recurrence
Proposed Completion Date for Each Action
Individual(s) Responsible for Each Action
Method of Verification
Date Corrective Action Plan Closed?



TASK 3: WATER QUALITY MONITORING

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TASK 3: WATER QUALITY MONITORING

General Monitoring Guidance

Monitoring programs should address program goals, identify reference and baseline conditions for future comparisons, and address areas that have water quality concerns, as identified by Basin Steering Committees and water quality assessments (e.g., Texas Water Quality Inventory Report, Basin Summary Report). 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)

(www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_procedures.html) are crucial guides for conducting water quality monitoring. The most current version of the TCEQ *Guidance for Assessing and Reporting Surface Water Quality in Texas* (http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/305_303.html) should be referenced when determining the amount of data needed for the assessment of various uses.

Basin monitoring programs should provide:

- monitoring that considers chemical, physical, and biological data collection and evaluation that will advance the ability to identify and locate water quality issues
- water quality sampling to allow temporal and spatial analysis of water quality trends
- increased data collection for the development of water quality standards
- additional knowledge of flow for unclassified streams
- an enhancement of knowledge of current monitoring techniques.

Cost-effective watershed management decisions must be based on *scientifically valid* and *complete* assessments of water quality conditions and contributing causes of impact. Water bodies should be selected based on the importance of the resource, risk from pollution, and input from the Steering Committee. Sites are chosen to be representative of the water body or a portion of the water body.

Deliverables

Deliverables for this task include a summary of all the monitoring activities for each quarter with each progress report. In addition, quarterly status reports and final reports for special studies are included in this task. The status reports need to provide information on the activities related to each special study and will be submitted with each progress report. The special study final reports will be submitted as designated in the work plan, typically at the end of the contract period and will contain sections similar to those outlined in Exhibit 3B. The biological data reporting packets are another deliverable under this task and should be submitted as a final report in *.PDF format as outlined in Exhibit 3D. The checklist, forms, and metrics are available on the Internet at (www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_resources.html). The electronic data generated from this monitoring will be submitted, as outlined in the QAPP, in the Events/Results format described in Task 4 as part of the deliverables for Task 4. Coordinated monitoring efforts will include facilitating a meeting with the other monitoring entities in the basin and communicating statewide coordinated monitoring schedule updates to the CRP Project Manager.

Types of Monitoring

Monitoring activities can be grouped into four categories. Basin monitoring programs may employ any or all of these types of monitoring to achieve the stated monitoring objectives. These activities characterize the status of water quality conditions and provide specific data in support of permit and regulatory decisions. The four categories, described below, are:

- routine monitoring
- systematic monitoring
- non-routine monitoring
- permit support monitoring
- special studies in priority watersheds

Routine Monitoring

Routine monitoring is the traditional type of monitoring designed to delineate overall water quality throughout a river basin, and is not intentionally targeted toward any environmental condition or event. A routine monitoring network can provide information about water bodies with high public interest, reference conditions at ecoregion sites, and areas with persistent water quality problems. The monitoring design will be dependent on the actual use of the water body and potential sources of contamination. At a minimum, annual monitoring will include quarterly field measurements, flow measurements (where applicable), indicator bacteria analysis, and conventional chemical parameter analysis. Common objectives of routine water quality monitoring include:

- collection of surface water data needed for conducting water quality assessments in accordance with TCEQ's *Guidance for Assessing and Reporting Surface Water Quality in Texas* (see web site reference on page 3-3)
- identifying water quality trends
- monitoring progress in protecting or restoring water quality.

Systematic Watershed Monitoring

Systematic watershed monitoring is similar to routine monitoring except sampling is of short duration (1 to 2 years) and is designed to screen waters that are rarely monitored. Systematic monitoring has several common objectives including:

- screening waters that would not normally be included in the routine monitoring program
- monitoring at sites to check the status of water bodies (identify improvements or concerns)
- investigate areas of potential concern.

Due to the limited period of time for which these data will be collected, the data will be primarily used to determine whether any locations have values above the TCEQ's water quality criteria or screening levels (or in some case values elevated above normal). When values are significantly elevated, the Planning Agency will use this information to determine future monitoring priorities.

This monitoring can follow either a rotational watershed approach or an intensive watershed evaluation. A rotational watershed approach is a plan that divides the river basin into distinct watersheds or, in some cases, subwatersheds. The watershed areas are then designated for a year or two of monitoring, in succession. Within each watershed, sampling sites are selected that adequately characterize the watershed. An intensive watershed evaluation is similar to the rotational

watershed approach except that a specific watershed is selected due to a perceived condition and further information is needed to characterize the water body. Once the information is collected and analyzed, it may indicate the need for a special study which can be designed based on the data collected.

Monitoring will follow the same protocols and standard field and laboratory measurements as routine monitoring, unless otherwise specified in the Quality Assurance Project Plan (QAPP). At a minimum, monitoring will usually include quarterly field measurements, flow measurements (where applicable), indicator bacteria analysis, and conventional chemical parameter analysis. If one of the objectives for the systematic data is to have it assessed by the TCEQ for the *Water Quality Inventory and 303(d) List*, monitoring should be conducted considering the specifications outlined in the most current version of the TCEQ *Guidance for Assessing and Reporting Surface Water Quality in Texas* (http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/305_303.html).

Non-Routine Monitoring

Non-routine monitoring is designed to target specific environmental conditions (e.g., runoff flow, index period, spills). If the objective of the monitoring can only be met under these conditions, then the monitoring should be considered non-routine. These data quality objectives should be outlined and discussed in the QAPP so the eventual data use can be determined by the user.

Permit Support Monitoring

The TCEQ or the regulated community may identify specific areas where additional information on water quality and quantity is needed for the permitting process. Data objectives will be determined by the project, but common objectives include:

- studies to develop site-specific criteria
- receiving water assessments
- characterization of flow conditions.

Permit support monitoring must be planned with the appropriate TCEQ staff through the Clean Rivers Program (CRP) Project Manager to ensure the most beneficial data are collected appropriately. Since these efforts are generally of short, intense duration, the TCEQ has attempted to separate these efforts from routine and systematic monitoring. In order to simplify this process, these sampling efforts should be set apart by developing them as a QAPP appendix (as described in Task 2) that can be independently replaced or amended.

The TCEQ has developed a guidance document for measuring flows (location, frequency, and method), titled "Stream Classification and Flow Measurement," and is included in Exhibit 3A. In addition to the standard electronic data submittal to SWQMIS described in Task 4, the flow cross section information must be provided in a format similar to the one located at (www.tceq.state.tx.us/assets/public/compliance/monops/water/wqm/forms/TCEQ20117_StreamFlow_MeasurementForm.pdf). Field measurement data may also be collected during each flow survey and submitted electronically in the Event/Result format outlined in Task 4.

Special Studies in Priority Watersheds

Basin Steering Committee priorities and TCEQ assessment needs may be addressed through intensive data collection efforts to better identify and evaluate water quality issues, such as, loading contributions from nonpoint sources in the watershed and problems identified through data analyses. Typically, special study monitoring involves the development of a plan that is designed to answer a specific question, and is not used to generally screen a water body. Monitoring may be conducted at historical sites that are representative of the affected portion of the water body where previous

sampling initially identified an impact or concern. Additional sites may be needed to establish the geographic extent of the issue.

Planning Agencies should review available reports and data before submitting a special study proposal that will outline how they can address the issue(s). Special studies must be planned with the appropriate TCEQ staff through the CRP Project Manager, as specified in Task 2, to ensure the most beneficial data are collected appropriately. The CRP Project Manager will work with each Planning Agency to plan studies that meet its current resources and capabilities. Status reports describing activities related to special studies will be submitted with each progress report as either an attachment, or as part of the progress report. Most special studies will result in a final report that summarizes and concludes the activities. A basic report outline has been provided in Exhibit 3B. In order to simplify this process, these sampling efforts should be set apart by developing them as a QAPP appendix (as described in Task 2) that can be independently revised.

Special Studies Mapping

For some special studies, the Planning Agency will coordinate with the CRP Project Manager and specify in the work plan, the types of environmental factors influencing water quality that will be collected and mapped. Those factors selected will relate to the water quality issue under study for the watershed. The intent of efforts to collect spatial data is to gain a detailed understanding of the factors influencing the water quality in a relatively small watershed. The results of the data collection effort will be a series of maps and, in some cases, database tables showing the information that has been collected and mapped within each selected special study watershed. In addition, a discussion of the factors in the watershed will be used to determine if there is any correlation with water quality.

Continuous Monitoring

Basin monitoring programs have traditionally been implemented by visiting a site and taking grab samples to characterize water quality. This type of monitoring gives you a snapshot of the conditions at that point in time, but does not provide information about the variability that may be of interest to some water quality program managers. In situ analyzers characterize water quality in greater detail than is possible with grab samples or short-term deployments of monitoring instruments. This type of continuous monitoring has generically been referred to as "real-time monitoring" since it is possible to access the data from a remote location as the instrument is collecting them.

Continuous monitoring can potentially be used for a variety of purposes, with objectives including:

- identifying seasonal water quality trends and daily variation
- evaluating the influence of point and non-point sources of pollution, including short-term events
- assessing effectiveness of watershed management and implementation plans
- providing current data to the public

Improved instrumentation and communication systems are making real-time monitoring more feasible. Although the up-front costs in establishing a real-time monitoring strategy are considerably more than the traditional monitoring strategies, the expense may be justified by the monitoring objectives. Opportunities to partner with other agencies, including the TCEQ, has allowed real-time monitoring to be more economically feasible for those wanting to establish these programs.

Parameters Monitored

Field Parameters

Parameters measured in the field are used to detect and describe spatial and temporal changes, determine impacts of point and nonpoint sources, and assess compliance with water quality standards. Dissolved oxygen (DO), water temperature, total dissolved solids (often evaluated with specific conductance), and pH are field measurements for which water quality criteria are established for each classified water body. The measurement of flow at stream sites is also crucial in evaluating water quality. Samples for most parameters collected on perennial streams at flow conditions less than 7Q2 (seven-day, two-year low-flow) cannot be used for assessment purposes; however, extreme low-flow sampling results can contribute to the understanding of water quality changes during drought conditions and aid in long-term water resource planning.

Many chemical and biological processes in the aquatic environment are affected by the levels of each of these field parameters. Evaluation of field measurements also provides complimentary information necessary in evaluating chemical and biological data. A list of the Surface Water Quality Monitoring (SWQM) program water quality monitoring core parameters can be found in Exhibit 3C.

Like continuous monitoring, measuring the variability of short-term conditions over a 24 or 48-hour period will provide more information than an instantaneous measurement. The objective for diel data is to collect and report surface water quality data that are representative of the diurnal variation in field parameters, such as, pH, temperature, dissolved oxygen, and specific conductance for comparison against the water quality standard. Water bodies identified with aquatic life concerns based on instantaneous dissolved oxygen measurements should be considered for 24-hour dissolved oxygen monitoring.

Conventional Parameters

Water samples collected and sent to a qualified lab for analysis are also an important part of the water quality monitoring program. Analysis of nutrients in water samples is needed to determine whether the stream exhibits a potential for generating excessive plant growth which, in turn, can lead to eutrophication and problems with dissolved oxygen. Some of the most commonly used analyses for nutrients are nitrate-nitrogen, ammonia-nitrogen, orthophosphate-phosphorus, and total phosphorus. In addition, chlorophyll *a* may be analyzed to determine the level of algal phyto-pigments as an indicator of algal biomass in the water column. Chloride, sulfate, and total dissolved solids are analyzed to determine density stratification, document amounts and dispersion of pollutants, and evaluate the mixing of fresh and salt water in estuaries. A list of the SWQM program water quality monitoring core parameters can be found in Exhibit 3C.

Toxic Substances

Specific toxic substances (pollutants regulated by 30 TAC §307.6, Texas Surface Water Quality Standards)

www.tceq.state.tx.us/permitting/water_quality/wq_assessment/standards/WQ_standards_intro.html) should be monitored in water, sediment, and fish tissue at selected sites where water monitoring workgroups have deemed that impact to water quality is likely. After an impact has been identified, monitoring efforts should move upstream to focus on identifying sources of concern for each subwatershed (point and nonpoint sources). A list of the SWQM program water quality monitoring core parameters can be found in Exhibit 3C.

Metals and Organics in Water: Monitoring metals and organics in water should initially focus on those subwatersheds where concentrations of permitted and nonpoint source pollutants might be

anticipated. A complete scan of permitted pollutants may be prohibitive in cost, and is not generally recommended. The analysis of individual pollutants should be determined based on comprehensive watershed inventories, identification of water quality problems and their sources, and on past data analyses.

Metals and Organics in Sediment: Monitoring total metals in sediment should initially focus on those subwatersheds where the pollutants might be anticipated. In addition, conventional parameters in sediment can also be analyzed to provide valuable information. The results of sediment analyses are used to evaluate the condition of the benthic macroinvertebrate habitat, to determine point and nonpoint source impacts, and to monitor rates of recovery following establishment of pollution controls or improved wastewater treatment.

Fish Tissue: Fish tissue sampling to assess human health risk should only be conducted if tissue contamination is probable. Sampling should be designed and conducted cooperatively with the Department of State Health Services (DSHS) since these surveys require substantial resources. For example, fish tissue should be collected where instream concentrations of a toxic compound, known to bioaccumulate, have been found at levels above the human health criteria. Fish tissue samples for purposes other than to assess human health risk are outlined in the TCEQ *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue* (RG-415). Surveys to assess risk to aquatic predators can also be done cooperatively with the Texas Parks and Wildlife Department (TPWD).

Bacterial Measurements

Two forms of bacteria are analyzed in water samples to determine support of the contact recreation use: *Esherichia coli* (*E. coli*) in freshwater, and *Enterococci* in tidal water and designated inland waters. TCEQ can assist the Planning Agency in determining which indicator bacteria need to be analyzed. A list of the SWQM program water quality monitoring core parameters can be found in Exhibit 3C.

Biological/Habitat Assessments

The health of aquatic systems can also be assessed by evaluating the biological community present. Along with physical habitat information, fish and benthic macroinvertebrates are collected and identified in a manner that permits an assessment of the composition and integrity of the aquatic community. Biological communities are useful in assessing water quality for a variety of reasons, including their sensitivities to low-level disturbances and their function as continuous monitors. Common objectives for biological monitoring include:

- collect data useful for assessing, verifying, and determining appropriate aquatic life uses
- inventory fish and benthic macroinvertebrate communities
- collect data to be used for community structure trend analysis
- correlate measures of chemical water quality to biological information, where possible
- assess the effects of episodic spills and dumping of pollutants, wastewater treatment plant malfunctions, toxic nonpoint source pollution, or other impacts that periodic chemical sampling is unlikely to detect.
- assess the effects of perturbations of the physical habitat such as sedimentation from stormwater runoff, dredging, or channelization
- monitor rates of recovery following implementation of improved wastewater treatment
- provide early warning of potential impacts.



Methods outlined in the TCEQ *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data* (RG-416) (www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_resources.html) are recommended for fish, benthic macroinvertebrate, and habitat sampling in freshwater, wadeable streams. Methodologies for assessing tidal streams, reservoirs, and estuaries have not been developed. A systematic watershed monitoring approach of the biological community involves the determination of a “reference” condition that is representative of the watershed in a healthy, non-impacted condition from which to compare other sites within the watershed. Locations where conditions differ significantly from reference conditions may be impacted by pollution, and should be the focus of further investigation and/or possible remedial action. When possible, the determination of habitat, fish, and/or benthic macroinvertebrate integrity should be used in conjunction with physical and chemical data to provide an integrated assessment of support of the aquatic life use for water bodies identified in the Texas Surface Water Quality Standards (TSWQS) (Appendices A and D) (www.tceq.state.tx.us/permitting/water_quality/wq_assessment/standards/WQ_standards_intro.html).

All biological/habitat data reported to the TCEQ under the approved QAPP, should also be summarized and submitted electronically using the Biological Data Summary Packet, an outline of which can be found in Exhibit 3D, and available on the Internet at (www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_resources.html).

Ambient Toxicity

Ambient toxicity is another effective means of determining whether any substances in the water are having an effect on the reproductivity and survivability of fish and benthic macroinvertebrates that typically inhabit those waters. Sites should be selected based on the following criteria:

- known or suspected toxicity, suggested by supporting information
- integration of toxicity sampling with other biological or chemical testing at a contaminated site
- importance of the water body uses that may be impaired.

Basin Monitoring Planning, Coordination, and Development

Developing a comprehensive basin monitoring program that supports the various basin and statewide objectives requires intensive planning and coordination. The monitoring programs necessitate annual review and evaluation to address new cooperative efforts and emerging priorities and to ensure that monitoring programs remain effective and viable.

The intent, purpose, and protocols for each type of monitoring described in this task serve to support the decision about which type of monitoring to use and where to use it. A major objective of monitoring under the Clean Rivers Program is to provide data to support the assessment of surface water quality, water quality standards, and wastewater permits; therefore, monitoring decisions should be made considering the minimum requirements needed to support these objectives. These objectives are outlined in the most recent version of the TCEQ *Guidance for Assessing and Reporting Surface Water Quality in Texas* (http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/305_303.html).

Coordinated Monitoring Process

Each spring, monitoring organizations meet to develop a coordinated monitoring schedule to be implemented in the coming fiscal year. The goal of this activity is to provide a process by which the Planning Agencies will coordinate their monitoring activities with the TCEQ and other basin monitoring organizations collecting data under a TCEQ or federally approved QAPP. By participating in this activity, Planning Agencies will be in compliance with the contract provision requiring that monitoring programs be planned in consultation with the TCEQ, as it relates to routine monitoring, and that monitoring resources for the basin will be more efficiently used.

Coordinated Monitoring Meeting Participation

Those organizations that have been identified as willing to comply with TCEQ requirements for collecting quality-assured water quality data should be invited to participate in the coordinated monitoring meeting. Where possible, invite other local monitoring entities (e.g., Texas Parks and Wildlife, USGS, Texas State Soil and Water Conservation Board) to participate. Depending on the type of monitoring (e.g., stormwater, routine, seasonal), the information entered into the schedule will need to follow the monitoring types code definitions to ensure the data quality objectives are conveyed to the eventual data user. The monitoring type codes can be found in Chapter 4 of the *TCEQ Data Management Reference Guide*

http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wdma/dmrg_index.html.

The coordinated monitoring schedule also has a link to a Special Projects area. These special projects may extend over multiple basins and years, and generally include information about other monitoring efforts going on in each basin.

Coordinated Monitoring Meeting Preparation

In preparation for the meeting, the Planning Agency should seek input from the Basin Steering Committee or technical subcommittee regarding stakeholder monitoring issues or concerns to be addressed. Critical dates for monitoring meetings and associated deliverables are in the CRP shell work plan. The last possible date for the coordinated monitoring meeting should be indicated in the final work plan. Before finalizing the date of the meeting, the Planning Agency should get agreement on the date from all invitees.

Prior to the meeting, the current fiscal year's schedule will be used to populate the upcoming planning fiscal year's database on the statewide coordinated monitoring schedule posted at <http://cms.lcra.org>. The Special Projects page will also be updated to include projects where TCEQ is anticipating receiving data, even if it is not for assessment purposes. The TCEQ will post reference materials on the web that will provide guidance on monitoring priorities and preparing for the monitoring meeting (http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/coop_monitoring.html). To ensure an effective meeting and the participation of all appropriate parties, the following steps should be taken prior to the meeting:

- Prior to attending a coordinated monitoring meeting, use the current TCEQ reference materials and monitoring objectives for the basin when developing a draft schedule for the upcoming state fiscal year.
- Sites should be selected to meet the objective of the monitoring. If the objective is the assessment of overall water quality, then the site should be representative of that water body. Please see Chapter 2 of the *TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods* (RG-415), for information on selecting a representative site.
- List the frequency of sampling for each parameter set. Provide a list of what will be included in each parameter set monitored.

- Print copies of the draft basin schedule, which is sorted by segment then site description, from the statewide schedule on the web to ensure the most current edits are incorporated. Generate enough copies for everyone to use as a worksheet at the meeting.
- If the internet is unavailable for your meeting, create maps of a suitable scale that clearly identify each sampling site on the proposed coordinated monitoring schedule. Be sure to include and label major roads, cities, county lines, water bodies, outfalls, and agricultural areas.

Conducting the Coordinated Monitoring Meeting

Coordinated monitoring meetings are working meetings in which monitoring 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. It is important to begin documenting information about why sites are being monitored (e.g., site was added for BMP effectiveness monitoring; site is a long term trend site; site is a TCEQ least disturbed reference stream). This documentation can be added to the coordinated monitoring schedule "Comments" field or in a separate summary document about the stations in each basin. The TCEQ stations database has a comment field where this information may be captured when a station is created (SLOC process in SWQMIS), or a SLOC change request can be submitted to add this information.

Coordinated Monitoring Meeting Follow-Up

As a follow-up to each coordinated monitoring meeting, a "Summary of Changes" will be produced that reflects the meeting's discussions and outcomes. The summary should reflect what decisions were made: why a site was dropped or added, why the frequency was altered, why a parameter was dropped or added, why a monitoring need was unable to be addressed, and what are the future monitoring recommendations. This information will also be used in the QAPP Appendix B to help explain the sample design rationale, as well as, the justification of changes during the schedule updates. An example "Summary of Changes" can be found in Exhibit 3E.

Many factors may influence monitoring decisions after a coordinated monitoring meeting has been attended (e.g., stakeholder or TCEQ issues need to be addressed, monitoring resources needed in another basin). Participants in the coordinated monitoring schedule process should continue to communicate schedule changes until the schedule is finalized, as well as, throughout the year.

Maintaining the Monitoring Schedule

The statewide coordinated monitoring schedule will be maintained on the Internet at <http://cms.lcra.org>. A link to this web site should be readily accessible from the Planning Agency's CRP web page. All coordinated monitoring schedules need to be "finalized" by May 31, and the deliverable will be the submittal of the Summary of Changes. Changes to the monitoring schedule should also be provided to the Steering Committee. Updates that occur during the year should be described in the quarterly Progress Report.

Since CRP Partners, TCEQ Region Offices, and TCEQ program areas have password access to update the statewide schedule at any time, all parties identified in the schedule should coordinate and communicate monitoring changes with each other on an on-going basis. Changes to the QAPP may impact the statewide schedule. After a QAPP amendment or appendix has been approved, the information should be reflected on the statewide schedule, and email notification sent to the TCEQ CRP Project Manager and other affected parties (e.g., TCEQ Regional Offices). Updates should also be provided in the quarterly Progress Report. Only the portion of the coordinated monitoring schedule covered by the Planning Agency's QAPP will be included in Appendix B of the QAPP.



Exhibit 3A

Stream Classification and Flow Measurements

EXHIBIT 3A STREAM CLASSIFICATION AND FLOW MEASUREMENTS

Stream Types

The TCEQ defines an intermittent stream as one that has a seven-day two-year low flow (7Q2) of less than 0.1 cfs or a period of zero flow for at least one week during most years. A stream is said to be intermittent with perennial pools if it meets the definition of intermittent and contains pools of sufficient size to support aquatic communities during times of critical low flow or no flow. A stream having a 7Q2 of 0.1 cfs or greater is considered perennial. Most streams for which flows have been requested are presumed to be perennial. Flow measurements have been requested for some streams that are intermittent with perennial pools in order to calculate a Harmonic Mean flow.

Flow Measurements

Flow measurements are needed by many in the regulated community during the permitting process. Some permittees discharge to intermittent streams that empty into perennial stream within three miles. In those cases, flows are not needed in the immediate receiving stream but in the perennial stream. *It is important for each River Authority to request a specific list of flow measurement sites from its CRP Project Manager to avoid collecting data at the wrong site.* In all cases, flow measurements should be made at least 100 feet above the point at which the effluent enters the perennial stream. For example, if the discharge is to "Dry Creek", an intermittent stream that flows into "Big Soggy Creek", a perennial stream within three miles of the discharge point, flows should be measured in Big Soggy Creek at least 100 feet upstream of the mouth of Dry Creek.

Ideally, flows should be measured monthly for two years to capture a full range of flow conditions, but at a minimum, one year of monthly flow data are needed for calculations. Flow should be measured at about the same time of each month to keep the data evenly spaced out over the year. A range of flows, **not just low flows**, is needed in order to optimize the statistical analysis that calculates 7Q2 and Harmonic Mean flows. Do not skip a flow measurement because of a rain event unless conditions are unsafe. It is important to note if stream flow ceases for one week or more at any time during the year.

The TCEQ *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue* (RG-415), contains a very comprehensive discussion of flow measurement techniques. It would be best to follow that procedure as closely as possible. Flow estimates or flows based on "floating chip" velocities are **not** acceptable.

Flow Data Calculations

The flow measurements will be matched with gaged flows in a nearby watershed for the same days; these pairs of flows will be used to develop a linear relationship between the data sets. Approximate 7Q2 and Harmonic Mean flows will be determined from the fit.



Exhibit 3B

Special Study Report Outline

EXHIBIT 3B SPECIAL STUDY REPORT OUTLINE

TITLE: Represents the report's content.

(Note: Titles should be clear, specific, and informative. If you cannot come up with such a title, then you may need to rethink your objective and your study design.)

TABLE OF CONTENTS: Provide an easy to follow guide of what the report has to offer. Add what is necessary so your audience can understand what is included in the report: list of abbreviations, list of tables, list of figures.

EXECUTIVE SUMMARY: Informative digest of the significant content and conclusions of the report. It is meant to be intelligible by itself, summarizing the purpose, findings, conclusions and recommendations.

(Note: This is the minimum that should be included on the web site when a report is too large, or includes graphs and figures that cannot be posted.)

INTRODUCTION: States the objective(s) of the report.

(Note: When the QAPP amendment was designed, the data quality objective(s) and the study design have already addressed this.)

PROJECT SIGNIFICANCE AND BACKGROUND: Why did you decide to do this project?

METHODS AND MATERIALS: Include enough detail that would allow someone to evaluate what was done or even duplicate if necessary (e.g., discuss experimental design).

RESULTS AND OBSERVATIONS: Presents the results that logically support (or provides data against) the objective stated in the introduction. Conclusions drawn from numerical data should be supported by brief explanations of the statistical criteria applied.

DISCUSSION: Interpret the data presented in the "Results and Observations" section, especially regarding the objective given in the introduction. Include discussion of previous findings that support and do not support your findings.

SUMMARY: State the conclusions that can be drawn from your data considering all the factors you presented in your "Discussion" section. State the logical implications of your findings for future application and study. What did you learn and what are the implications? What are the recommendations based on your findings? Was the objective accepted or rejected?

REFERENCES: Give credit where credit is due. If you reference or paraphrase other work, give the reference of the source document. If you researched lots of documents, but did not specifically reference them in your report, you may consider a BIBLIOGRAPHY since this will allow others more information if they are interested.

APPENDICES: Include as necessary to clarify or supplement the text. This could include the raw data or a survey used to gather data.

CBE Style Manual Committee. CBE style manual: a guide for authors, editors, and publishers in the biological sciences. 5th ed. rev. and expanded. Chicago, IL: Council of Biology Editors, Inc.; 1983.

Brusaw, C.T., G.J. Alred, and W.E. Oliu. Handbook of technical writing. 5th ed. New York, NY: St. Martin's Press. 1997.



Exhibit 3C

Surface Water Quality Monitoring Core Parameters

EXHIBIT 3C SURFACE WATER QUALITY MONITORING CORE PARAMETERS

FIELD	* Priority
WATER TEMPERATURE (°C)	✓
PH (standard units)	✓
DISSOLVED OXYGEN (mg/L)	✓
SPECIFIC CONDUCTANCE (µmhos/cm @ 25°C)	✓
SECCHI DISC (meters) **Important parameter for reservoir ranking	✓
DAYS SINCE PRECIPITATION EVENT (days)	
SALINITY - ppt (saltwater only)	
CHLORINE RESIDUAL (mg/L) (downstream of WWTPs)	

FLOW	* Priority
FLOW:1=No Flow, 2=Low, 3=Normal, 4=Flood, 5=High, 6=Dry	✓
INSTANTANEOUS FLOW STREAM (cfs, ft ³ /s)	✓
FLOW METHOD 1=Flow Gage, 2=Electronic, 3=Mechanical, 4=Weir/Flume	

INDICATOR BACTERIA	* Priority
FECAL COLIFORM (#/100 ml)	✓
E. COLI (#/100 ml) (freshwater only)	✓
ENTEROCOCCUS (#/100 ml) (marine only)	✓

CONVENTIONAL PARAMETERS-INORGANIC	* Priority
ALKALINITY, TOTAL (mg/L as CaCO ₃)	
TOTAL SUSPENDED SOLIDS (mg/L)	
VOLATILE SUSPENDED SOLIDS (mg/L)	
TOTAL DISSOLVED SOLIDS (mg/L)	✓
CHLORIDE (mg/L as Cl)	✓
SULFATE (mg/L as SO ₄)	✓
TOTAL ORGANIC CARBON(mg/L as C)	

CONVENTIONAL PARAMETERS-NUTRIENTS	* Priority
NITRITE + NITRATE-NITROGEN (mg/L as N)	✓
AMMONIA-NITROGEN (mg/L as N)	✓
ORTHO-PHOSPHATE (mg/L as P)	✓
TOTAL PHOSPHATE (mg/L as P)	✓
CHLOROPHYLL-A (µg/L)	✓
TOTAL KJELDAHL NITROGEN (mg/L as N)	
PHEOPHYTIN-A (µg/L)	

* Parameter Used/Needed for Regulatory Purposes



24 HOUR (Diel) PARAMETERS	* Priority
DISSOLVED OXYGEN, 24-HOUR AVG (mg/L)	✓
DISSOLVED OXYGEN, # MEASUREMENTS DURING 24-HR	✓
DISSOLVED OXYGEN, 24-HOUR MAX.(mg/L)	✓
DISSOLVED OXYGEN, 24-HOUR MIN. (mg/L)	✓
WATER TEMPERATURE, 24-HR AVERAGE (°C)	
WATER TEMPERATURE, # OF MEASUREMENTS DURING 24-HRS	
WATER TEMPERATURE, MAXIMUM 24-HR (°C)	
WATER TEMPERATURE, MINIMUM 24-HR (°C)	
SPECIFIC CONDUCTANCE, 24-HR AVERAGE (°C)	
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS DURING 24-HRS	
SPECIFIC CONDUCTANCE, MAXIMUM 24-HR (°C)	
SPECIFIC CONDUCTANCE, MINIMUM 24-HR (°C)	
pH, # OF MEASUREMENTS DURING 24-HRS	
pH, MAXIMUM 24-HR (°C)	
pH, MINIMUM 24-HR (°C)	
SALINITY, 24-HR AVERAGE (°C)	
SALINITY, # OF MEASUREMENTS DURING 24-HRS	
SALINITY, MAXIMUM 24-HR (°C)	
SALINITY, MINIMUM 24-HR (°C)	

* Parameter Used/Needed for Regulatory Purposes

METALS IN WATER	* Priority
DISSOLVED (µg/L)	
ALUMINUM (Al)	✓
ARSENIC (As)	✓
CADMIUM (Cd)	✓
CHROMIUM (Cr)	✓
COPPER(Cu)	✓
LEAD (Pb)	✓
NICKEL (Ni)	✓
SILVER (Ag)	✓
ZINC (Zn)	✓
BARIUM (Ba)	
IRON (Fe)	
MANGANESE (Mn)	
MOLYBDENUM (Mo)	
TOTAL (µg/L)	
MERCURY (Hg)	✓
SELENIUM (Se)	✓
TOTAL HARDNESS (mg/L as CaCO₃)	✓

* Parameter Used/Needed for Regulatory Purposes

ORGANICS IN WATER ($\mu\text{g/L}$) ♦= AQUATIC LIFE USE; ■= HUMAN HEALTH	* Priority
Semivolatile	
PHENOL (C ₆ H ₅ OH)-SINGLE COMPOUND	
2-CHLOROPHENOL	
2-NITROPHENOL	
2,4-DICHLOROPHENOL	
PARACHLOROMETA CRESOL	
2,4,5-TRICHLOROPHENOL ■	✓
2,4,6-TRICHLOROPHENOL	
2,4-DIMETHYLPHENOL	
2,4-DINITROPHENOL	
4-NITROPHENOL	
DNOC (4,6-DINITRO-ORTHO-CRESOL)	
PCP (PENTACHLOROPHENOL)♦ ■	✓
N-NITROSODIMETHYLAMINE	
BIS (2-CHLOROETHYL) ETHER	
1,3-DICHLOROENZENE ■	✓
1,4-DICHLOROENZENE ■	✓
1,2-DICHLOROENZENE ■	✓
BIS (2-CHLOROISOPROPYL) ETHER	
HEXACHLOROETHANE ■	✓
N-NITROSO-DI-N-PROPYLAMINE	
NITROBENZENE ■	✓
ISOPHORONE	
BIS (2-CHLOROETHOXY) METHANE	
1,2,4-TRICHLOROENZENE	
NAPHTHALENE	
HEXACHLOROBTADIENE ■	✓
HEXACHLOROCYCLOPENTADIENE	
2-CHLORONAPHTHALENE	
ACENAPHTYLENE	
DIMEHTYL PHTHALATE	
2,6-DINITROTOLUENE	
ACENAPHTHENE	
2,4-DINITROTOLUENE	
FLUORENE	
4-CHLOROPHENYL PHENYL ETHER	
DIETHYL PHTHALATE	
N-NITROSODIPHENYLAMINE	
1,2-DIPHENYLHYDRAZINE	
4-BROMOPHENYL PHENYL ETHER	
PHENANTHRENE ♦	✓

ORGANICS IN WATER ($\mu\text{g/L}$) ♦= AQUATIC LIFE USE; ■= HUMAN HEALTH	* Priority
ANTHRACENE	
DI-N-BUTYL PHTHALATE	
FLUORANTHENE	
PYRENE	
BENZIDINE ■	✓
N-BUTYL BENZYL PHTHALATE	
CHRYSENE ■	✓
BENZO(A)ANTHRACENE ■	✓
3,3'-DICHLOROBENZIDINE	
BIS(2-ETHYLHEXYL) PHTHALATE	
DI-N-OCTYL PHTHALATE	
BENZO(B)FLUORANTHENE	
BENZO(K)FLUORANTHENE	
BENZO-A-PYRENE ■	✓
INDENO (1,2,3-CD) PYRENE	
1,2,5,6-DIBENZANTHRACENE	
BENZO(GHI)PERYLENE	
CRESOL ■	✓
HEXACHLOROPHENE ■	✓
N-NITROSODIETHYL AMINE ■	✓
N-NITROSODI-N-BUTYL AMINE ■	✓
PYRIDINE ■	✓
1,2,4,5-TETRACHLOROBENZENE ■	✓
Volatile	
CHLOROMETHANE	
BROMOMETHANE	
VINYL CHLORIDE ■	✓
CHLOROETHANE	
ACRYLONITRILE ■	✓
CHLOROFORM ■	✓
METHYLENE CHLORIDE	
1,1-DICHLOROETHYLENE ■	✓
1,1-DICHLOROETHANE	
TRANS-1,2-DICHLOROETHENE	
1,2-DICHLOROETHANE ■	✓
CARBON TETRACHLORIDE ■	✓
BROMODICHLOROMETHANE	
BENZENE ■	✓
CHLORODIBROMOMETHANE ■	✓



ORGANICS IN WATER ($\mu\text{g/L}$) ♦= AQUATIC LIFE USE; ■= HUMAN HEALTH	* Priority
1,1,1-TRICHLOROETHANE ■	✓
1,2-DICHLOROPROPANE	
TRANS-1,3-DICHLOROPROPENE ■	✓
CIS-1,3-DICHLOROPROPENE ■	✓
1,1,2-TRICHLOROETHANE	
2-CHLOROETHYL VINYL ETHER	
TRICHLOROETHYLENE ■	✓
BROMOFORM	
TOLUENE	
ETHYLBENZENE	
1,1,2,2-TETRACHLOROETHANE	
TETRACHLOROETHYLENE ■	✓
CHLOROBENZENE	
XYLENE	
BIS (CHLOROMETHYL) ETHER ■	✓
1,2-DIBROMOETHANE ■	✓
METHYL TERT-BUTYL ETHER (MTBE) ■	✓
Pesticides	
DDT ♦ ■	✓
DDD ■	✓
DDE ■	✓
ALDRIN ♦ ■	✓
DIELDRIN ♦ ■	✓
ENDRIN ♦ ■	✓
CHLORDANE ♦ ■	✓
ALACHLOR ■	✓
HEPTACHLOR ♦ ■	✓
HEPTACHLOR EPOXIDE ■	✓
METHOXYCHLOR ♦ ■	✓
METOLACHLOR ■	✓
LINDANE (GAMMA BHC) ♦ ■	✓
TOXAPHENE ♦ ■	✓
SIMAZINE ■	✓
ATRAZINE ■	✓
CYANAZINE	
HEXACHLOROBENZENE ■	✓
ALPHA BENZENE HEXACHLORIDE (BHC) ■	✓
BETA BENZENE HEXACHLORIDE (BHC) ■	✓
DELTA BENZENE HEXACHLORIDE (BHC)	



ORGANICS IN WATER ($\mu\text{g/L}$) ♦= AQUATIC LIFE USE; ■= HUMAN HEALTH	* Priority
DICOFOL (KELTHANE) ♦ ■	✓
MIREX ♦	✓
PENTACHLOROBENZENE ■	✓
MALATHION ♦	✓
PARATHION ♦	✓
DIAZINON	
2,4-D ■	✓
2,4,5-T ■	✓
SILVEX	
DIURON (KARMEX) ♦	✓
DURSBAN (CHLOROPYRIFOS) ♦	✓
ENDOSULFAN I (ALPHA) ♦	✓
ENDOSULFAN II (BETA) ♦	✓
ENDOSULFAN SULFATE ♦	✓
DEMETON ♦	✓
GUTHION ♦	✓
SEVIN	
PCB-1242	
PCB-1254	
PCB-1221	
PCB-1232	
PCB-1248	
PCB-1260	
PCB-1016	
TOTAL PCBs ♦ ■	✓

* Parameter Used/Needed for Regulatory Purposes

METALS IN SEDIMENT (mg/kg-dry weight)	* Priority
ALUMINUM (Al)	✓
ARSENIC (As)	✓
BARIUM (Ba)	✓
CADMIUM (Ca)	✓
CHROMIUM (Cr)	✓
COPPER (Cu)	✓
LEAD (Pb)	✓
MANGANESE (Mn)	✓
MERCURY (Hg)	✓
NICKEL (Ni)	✓
SELENIUM (Se)	✓
SILVER (Ag)	✓



METALS IN SEDIMENT (mg/kg-dry weight)	* Priority
ZINC (Zn)	✓
Sediment Conventionals	
OIL & GREASE (mg/kg)	
PERCENT SOLIDS IN SEDIMENT, DRY WEIGHT	
TOTAL ORGANIC CARBON, DRY WEIGHT (mg/kg)	
SEDIMENT PARTICLE SIZE <0.0039 CLAY % DRY WT	
SEDIMENT PARTICLE SIZE 0.0039-.0625 SILT % DRY WT	
SEDIMENT PARTICLE SIZE 0.0625-2MM SAND % DRY WT	
SEDIMENT PARTICLE SIZE >2.0MM GRAVEL % DRY WT	
<p>The highlighted 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.</p>	

* Parameter Used/Needed for Regulatory Purposes

ORGANICS IN SEDIMENT (μ g/kg-dry weight)	* Priority
Semivolatile	
PHENOL(C6H5OH)-SINGLE COMPOUND	✓
2-CHLOROPHENOL	✓
2-NITROPHENOL	✓
2,4-DICHLOROPHENOL	✓
PARACHLOROMETA CRESOL	✓
2,4,5-TRICHLOROPHENOL	✓
2,4,6-TRICHLOROPHENOL	✓
2,4-DIMETHYLPHENOL	✓
2,4-DINITROPHENOL	✓
4-NITROPHENOL	✓
DNOC (4,6-DINITRO-ORTHO-CRESOL)	✓
PCP (PENTACHLOROPHENOL)	✓
N-NITROSODIMETHYLAMINE	✓
BIS (2-CHLOROETHYL) ETHER	✓
1,3-DICHLOROENZENE	✓
1,4-DICHLOROENZENE	✓
1,2-DICHLOROENZENE	✓
BIS (2-CHLOROISOPROPYL) ETHER	✓
HEXACHLOROETHANE	✓
N-NITROSODI-N-PROPYLAMINE	✓
NITROBENZENE	✓
ISOPHORONE	✓
BIS (2-CHLOROETHOXY) METHANE	✓
1,2,4-TRICHLOROENZENE	✓
NAPHTHALENE	✓
HEXACHLOROBUTADIENE	✓

ORGANICS IN SEDIMENT ($\mu\text{g}/\text{kg}$ -dry weight)	* Priority
HEXACHLOROCYCLOPENTADIENE	✓
2-CHLORONAPHTHALENE	✓
ACENAPHTYLENE	✓
DIMETHYL PHTHALATE	✓
2,6-DINITROTOLUENE	✓
ACENAPHTHENE	✓
2,4-DINITROTOLUENE	✓
FLUORENE	✓
4-CHLOROPHENYL PHENYL ETHER	✓
DIETHYL PHTHALATE	✓
N-NITROSODIPHENYLAMINE	✓
1,2-DIPHENYLHYDRAZINE	✓
4-BROMOPHENYL PHENYL ETHER	✓
PHENANTHRENE	✓
ANTHRACENE	✓
DI-N-BUTYL PHTHALATE	✓
FLUORANTHENE	✓
PYRENE	✓
BENZIDINE	✓
N-BUTYL BENZYL PHTHALATE	✓
CHRYSENE	✓
BENZO(A)ANTHRACENE	✓
3,3'-DICHLOROBENZIDINE	✓
BIS(2-ETHYLHEXYL) PHTHALATE	✓
DI-N-OCTYL PHTHALATE	✓
BENZO(B)FLUORANTHENE	✓
BENZO(K)FLUORANTHENE	✓
BENZO-A-PYRENE	✓
INDENO (1,2,3-CD) PYRENE	✓
DIBENZ (A,H) ANTHRACENE	✓
BENZO(GHI)PERYLENE	✓
CRESOL	✓
HEXACHLOROPHENE	✓
N-NITROSODIETHYLAMINE	✓
N-NITROSO-DI-N-BUTYLAMINE	✓
PYRIDINE	✓
1,2,4,5-TETRACHLOROBENZENE	✓



ORGANICS IN SEDIMENT ($\mu\text{g}/\text{kg}$ -dry weight)	* Priority
Pesticides	
DDT	✓
DDD	✓
DDE	✓
ALDRIN	✓
DIELDRIN	✓
ENDRIN	✓
CHLORDANE	✓
HEPTACHLOR	✓
HEPTACHLOR EPOXIDE	✓
METHOXYCHLOR	✓
LINDANE (GAMMA BHC)	✓
TOXAPHENE	✓
HEXACHLOROBENZENE	✓
ALPHA BENZENE HEXACHLORIDE (BHC)	✓
BETA BENZENE HEXACHLORIDE (BHC)	✓
DELTA BENZENE HEXACHLORIDE (BHC)	✓
DICOFOL (KELTHANE)	✓
MIREX	✓
PENTACHLOROBENZENE	✓
MALATHION	✓
PARATHION	✓
DIAZINON	✓
2,4-D	✓
2,4,5-T	✓
SILVEX	✓
DIURON (KARMEX)	✓
DURSBAN	✓
ENDOSULFAN I (ALPHA)	✓
ENDOSULFAN II (BETA)	✓
ENDOSULFAN SULFATE	✓
DEMETON	✓
GUTHION	✓
SEVIN	✓
PCB-1242	✓
PCB-1254	✓
PCB-1221	✓
PCB-1232	✓
PCB-1248	✓



ORGANICS IN SEDIMENT ($\mu\text{g}/\text{kg}$ -dry weight)	* Priority
PCB-1260	✓
PCB-1016	✓
TOTAL PCBs	✓

* Parameter Used/Needed for Regulatory Purposes

FISH TISSUE ANALYSIS (mg/kg-wet weight)	* Priority
Tissue	
FISH SPECIES, USE EPA STORET NUMERIC CODE	✓
ANATOMICAL PART, USE EPA STORET NUMERIC CODE	✓
NUMBER OF INDIVIDUALS IN COMPOSITE TISSUE SAMPLE	✓
NUMBER OF SPECIES IN COMPOSITE TISSUE SAMPLE	✓
SAMPLE LENGTH IN INCHES	
SAMPLE WEIGHT IN POUNDS	
SEX (1-MALE, 2-FEMALE, 3-MIXED, 4-UNKNOWN)	
Metals in Tissue	
ARSENIC	✓
CADMIUM	✓
CHROMIUM	✓
COPPER	✓
LEAD	✓
MERCURY	✓
SELENIUM	✓
Semivolatile Organics in Tissue	
PERCENT LIPIDS	
PHENOL	
2-CHLOROPHENOL	
2-NITROPHENOL	
2,4-DICHLOROPHENOL	
PARACHLOROMETA CRESOL	
2,4,5,-TRICHLOROPHENOL	
2,4,6-TRICHLOROPHENOL	
2,4-DIMETHYLPHENOL	
2,4-DINITROPHENOL	
4-NITROPHENOL	
DNOC (4,6-DINITRO-ORTHO-CRESOL)	
PCP (PENTACHLOROPHENOL)	✓
N-NITROSODIMETHYLAMINE	
BIS (2-CHLOROETHYL) ETHER	
1,3-DICHLOROENZENE	
1,4-DICHLOROENZENE	

FISH TISSUE ANALYSIS (mg/kg-wet weight)	* Priority
1,2-DICHLOROBENZENE	
BIS (2-CHLOROISOPROPYL) ETHER	
HEXACHLOROETHANE	✓
N-NITROSODI-N-PROPYLAMINE	
NITROBENZENE	✓
ISOPHORONE	
BIS (2-CHLOROETHOXY) METHANE	
1,2,4-TRICHLOROBENZENE	
NAPHTHALENE	
HEXACHLOROBUTADIENE	✓
HEXACHLOROCYCLOPENTADIENE	
2-CHLORONAPHTHALENE	
ACENAPHTHYLENE	
DIMETHYL PHTHALATE	
2,6-DINITROTOLUENE	
ACENAPHTHENE	
2,4-DINITROTOLUENE	
FLUORENE	
4-CHLOROPHENYL PHENYL ETHER	
DIETHYL PHTHALATE	
N-NITROSODIPHENYLAMINE	
1,2-DIPHENYLHYDRAZINE	
4-BROMOPHENYL PHENYL ETHER	
PHENANTHRENE	
ANTHRACENE	
DI-N-BUTYL PHTHALATE	
FLUORANTHENE	
PYRENE	
BENZIDINE	✓
N-BUTYL BENZYL PHTHALATE	✓
CHRYSENE	
BENZO(A)ANTHRACENE	✓
3,3'-DICHLOROBENZIDINE	
BIS(2-ETHYLHEXYL)PHTHALATE	
DI-N-OCTYL PHTHALATE	
BENZO(B)FLUORANTHENE	
BENZO(K)FLUORANTHENE	
BENZO-A-PYRENE	✓
INDENO(1,2,3-CD) PYRENE	
1,2,5,6-DIBENZANTHRACENE	



FISH TISSUE ANALYSIS (mg/kg-wet weight)	* Priority
BENZO(GHI)PERYLENE	
CRESOL	✓
HEXACHLOROPHENE	✓
N-NITROSODIETHYLAMINE	✓
N-NITROSO-DI-N-BUTYLAMINE	✓
PYRIDINE	✓
1,2,4,5-TETRACHLOROBENZENE	✓
Pesticides in Tissue	
PERCENT LIPIDS	
DDT	✓
DDD	✓
DDE	✓
ALDRIN	✓
DIELDRIN	✓
ENDRIN	
CHLORDANE	✓
HEPTACHLOR	✓
HEPTACHLOR EPOXIDE	✓
METHOXYCHLOR	
LINDANE (GAMMA BHC)	✓
TOXAPHENE	✓
HEXACHLOROBENZENE	✓
ALPHA BENZENE HEXACHLORIDE (BHC)	✓
BETA BENZENE HEXACHLORIDE (BHC)	✓
DELTA BENZENE HEXACHLORIDE	
DICOFOL (KELTHANE)	✓
MIREX	✓
PENTACHLOROBENZENE	✓
MALATHION	
PARATHION	
DIAZINON	
2,4-D	
2,4,5-T	
SILVEX (2,4,5-TP)	
DIURON (KARMEX)	
DURSBAN	
ENDOSULFAN	
ENDOSULFAN SULFATE	
DEMETON IN FISH TISSUE (SYSTOX)	



FISH TISSUE ANALYSIS (mg/kg-wet weight)	* Priority
GUTHION	
SEVIN (CARBARYL)	
PCB-1242	
PCB-1254	
PCB-1221	
PCB-1232	
PCB-1248	
PCB-1260	
PCB-1016	
TOTAL PCBS	✓

* Parameter Used/Needed for Regulatory Purposes



Exhibit 3D

Biological Data Reporting Packet Outline

EXHIBIT 3D ELEMENTS OF THE BIOLOGICAL DATA SUMMARY PACKET

This document provides guidance for **submitting** biological data which are collected for Routine Aquatic Life Monitoring (ALM), Aquatic Life Use Assessments (ALU), Use Attainability Analysis (UAA), and Receiving Water Assessments (RWA). For guidance in the **collection** of the biological data consult the Texas Commission on Environmental Quality (TCEQ) *Surface Water Quality Monitoring Procedures Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data* (RG-415) in conjunction with the *Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data*.

Items 1 - 4 below are the minimum data which should be submitted to the TCEQ as part of any biological assessment. These items should be compiled in a packet and submitted electronically to the TCEQ. If submitting the data as part of an UAA, please also utilize the UAA Report Outline to ensure, the summary of the collection efforts is complete. The TCEQ regional staff should submit the packets to the Surface Water Quality Monitoring Team (SWQM). Clean Rivers Program (CRP) Planning Agencies should submit packets to the appropriate TCEQ CRP Project Manager. Item 5 is optional.

1. Aquatic Life Monitoring and Habitat Assessment Checklist with map of area sampled
2. Biological Assessment
 - TCEQ Nekton Biological Data Reporting Form or equivalent for seining efforts
 - TCEQ Nekton Biological Data Reporting Form or equivalent for electrofishing efforts
 - TCEQ Benthic Macroinvertebrate Biological Data Reporting Form or equivalent
3. Habitat Assessment
 - TCEQ Habitat Reporting Form or equivalent
 - Part I - Stream Physical Characteristics Worksheet
 - Part II - Summary of Physical Characteristics of Water body
 - Representative photographs of site sampled
4. Field Data Reporting Form or equivalent and Stream Flow (Discharge) Measurement Form or equivalent
5. Metric Sets for Biological and Habitat Assessments
 - Regional Scoring Criteria for Determining ALU - Nekton
 - Scoring Criteria For Benthic Macroinvertebrate Rapid Bioassessment (RBA)
 - Scoring Criteria For Benthic Macroinvertebrate Quantitative Samples (Surber)
 - Part III - Habitat Quality Index



Aquatic Life Monitoring and Habitat Assessment Checklist

Background Information

Name of Water Body: _____

Segment Number: _____ Station ID: _____ On Segment: Yes No

Permit number, if applicable: _____ Circle Monitoring Objective: ALM, ALU, UAA, RWA

Historic Stream Characterization (check one):

Intermittent	Intermittent with perennial pools sufficient to support significant aquatic life use	Perennial	Unknown
--------------	--	-----------	---------

Basis for Historic Stream Characterization (describe):

Current Aquatic Life Use Designation (if classified segment or site specific standard determined)(circle one):

Exceptional High Intermediate Limited

Current Assessment Status on the _____ Water Quality Inventory [305(b)] (circle one):

Supported Partially Supported Not Supported Concern Not Assessed

Field Data Entry (FDE) Information: Date Entered Into FDE: _____ RTAG #: _____
(TCEQ Regional Biologists only)

Field Data (CRP Partners only): Tag #: _____

Objective for Aquatic Life Use Assessment

Is this water body supporting its designated uses? Yes No Reason: _____

Known/Potential Causes of Aquatic Life Use Concern/Impairment: _____

Identify Sources of Pollution:

Point Source: Yes No Identify: _____
Nonpoint Source: Yes No Identify: _____

Ambient Toxicity Tests in Water body? Yes No

Results:

	Sediment Chronic	Sediment Acute	Water Chronic	Water Acute
Significant Effect				
No Significant Effect				

Monitoring Information: Biological Monitoring Conducted During Index Period (03/15-06/30 and 10/01-10/15) and Critical Period (07/01-09/30). **Note:** If sampling event for a RWA, characterize the receiving stream upstream of the existing discharge point or downstream of the proposed discharge point.



Stream Characterization, Event 1, Date:

Dry	Pools Covering _____% of the _____ meters assessed	Flowing at _____ cfs (measured)
-----	---	------------------------------------

Stream Characterization, Event 2, Date:

Dry	Pools Covering _____% of the _____ meters assessed	Flowing at _____ cfs (measured)
-----	---	------------------------------------

Describe conditions which may have adversely affected stream during each sampling event (e.g., recent rains, drought, construction):

Nekton Sampling Event 1:

- Minimum 15-minute (900 seconds) electrofishing: Yes No
- Minimum 6 seine hauls (or equivalent effort to sample 60 meters): Yes No
- Fish sampling conducted in all available habitat types: Yes No
- If No**, describe why:

Benthic Macroinvertebrate Sampling Event 1:

- Indicate Method(s) Used:
- Rapid Bioassessment (5-minute kicknet or Snags):
- Quantitative (Surber or Snags or Dredge):

Habitat Assessment Event 1:

- TCEQ Habitat Protocols: Yes No

Stream Flow Measurement Event 1:

- Instantaneous measurement: Yes No
- USGS Gage Reading: Yes No

Nekton Sampling Event 2:

- Minimum 15-minute (900 seconds) electrofishing: Yes No
- Minimum 6 seine hauls (or equivalent effort to sample 60 meters): Yes No
- Fish sampling conducted in all available habitat types: Yes No
- If No**, describe why:

Benthic Macroinvertebrate Sampling Event 2:

- Indicate Method(s) Used:
- Rapid Bioassessment (5-minute kicknet or Snags):
- Quantitative (Surber or Snags or Dredge):

Habitat Assessment Event 2:

- TCEQ Habitat Protocols: Yes No
- If No**, flow, wetted channel width, photographs, description of bank conditions relative to first event, and description of canopy cover conditions relative to first event must be provided in this packet.

Stream Flow Measurement Event 2:

- Instantaneous measurement: Yes No
- USGS Gage Reading: Yes No



Assessment Results (Optional)

Fish Community Index Event 1:

Exceptional	High	Intermediate	Limited
-------------	------	--------------	---------

Fish Community Index Event 2:

Exceptional	High	Intermediate	Limited
-------------	------	--------------	---------

Benthic Macroinvertebrate Community Index Event 1:

Exceptional	High	Intermediate	Limited
-------------	------	--------------	---------

Benthic Macroinvertebrate Community Index Event 2:

Exceptional	High	Intermediate	Limited
-------------	------	--------------	---------

Habitat Index Event 1:

Exceptional	High	Intermediate	Limited
-------------	------	--------------	---------

Habitat Index Event 2:

Exceptional	High	Intermediate	Limited
-------------	------	--------------	---------

Outline for Use Attainability Analysis Report

Introduction

- Problem statement
- Objectives

Study Area

- Description of water body and designated uses and criteria
- Environmental features and population characteristics
- Permitted discharges
- Nonpoint sources
- Summary of historical data

Methodologies

- Station descriptions
- Sampling methods
- Survey descriptions

Results and Discussions

- Physical evaluation
 - Hydrology
 - Habitat
- Physicochemical evaluation
- Biological evaluation
 - Benthic macroinvertebrates
 - Fish
 - Other

Conclusions

References

Appendices



Exhibit 3E

**Coordinated Monitoring Meeting
Summary of Changes**



Coordinated Monitoring Meeting: April 9, 2009
Summary of Changes

The following changes, additions, or deletions have been made to the FY2010 Coordinated Monitoring Schedule to address monitoring issues identified by the involved monitoring entities or steering committee members.

1. The Guadalupe River at Dupont site will be discontinued at the present location and a new site that is downstream and out of the mixing zone of the Dupont discharges will be found for 2010.
2. A new site on Peach Creek will be added bimonthly in 2008 (site no. 17935, Peach Creek at FM 397.) Data at this site was collected during the Peach Creek TMDL. The site will be monitored in 2008 and beyond to identify any changes in the water quality that may be a result of the implementation of BMPs in the watershed.
3. The UGRA weekly monitoring of E. coli will no longer be funded by CRP. The TCEQ has sufficient data for assessment purposes and does not need the bacterial data at this frequency any longer. UGRA will evaluate their ability to continue monitoring at these sites for their own use and use by their constituents.
4. Region 13 will add a quarterly monitoring location in Cypress Bend Park on the Guadalupe River (station id to be determined).
5. Samples for E. coli will be sampled every Saturday for eight weeks, beginning in mid-May and ending in July 2007, for screening of bacterial concentrations during peak recreational use on the Comal and Guadalupe Rivers.
6. Camp Meeting Creek, segment 1806A, is impaired for dissolved oxygen. Biological and 24H information needs to be collected at this site. Neither GBRA or the Regional office could pick up this monitoring with available resources.
7. Organics in sediment, specifically those organics associated with urban environments (TPH and BTEX) have been identified by the Steering Committee as a concern and will be added as a special study later.



TASK 4: DATA MANAGEMENT

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TASK 4: DATA MANAGEMENT

Introduction

This task involves the preparation of water quality monitoring data to ensure data quality and compatibility with TCEQ requirements.

Emphasis for the FY 2010-2011 biennium is focused on:

- Using the *Surface Water Quality Monitoring Information System* (SWQMIS) web-enabled Sampling Station Request function
- Updating data
- Data Review Checklist and Summary
- Validating data to the level required by the *Data Management Reference Guide (DMRG)* and the *SWQM Procedures Manual*

www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wdma/dmrg_index.html

www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_procedures.html

Data Management Roles

Basin Planning Agency Data Management

The Planning Agency Data Manager is responsible for preparing data sets of quality-assured data in accordance with the Data Management Reference Guide (DMRG) for submittal to the TCEQ. Each data set submitted to the TCEQ should contain data collected under a single QAPP and should contain data collected no more than eight months prior to submission.

The Planning Agency Data Manager will review each data set using the Data Review Checklist (Exhibit 4A), and will prepare a Data Summary (Exhibit 4B) to be submitted with each data set. The Data Summary will contain basic identifying information about the data set, information regarding inconsistencies and errors identified during data verification and validation steps, and/or problems with data collection efforts.

TCEQ Data Management

The TCEQ staff receive and review data sets, and other requests for new codes / monitoring stations, or corrections to existing data. The TCEQ conducts automated reviews of incoming data sets and reviews data verification reports generated by SWQMIS against specifications in the QAPP.

Preparing and Reporting Data

Formatting Data

Data will be prepared for entry into the statewide water quality database (SWQMIS) by creating two text files that are related by a unique identification number (Tag ID) that is assigned to each sampling



event. The first file has each sampling event (unique date, time, depth, &/or station) and the second file has each measurement result that was collected and analyzed for that event (so there are many results for each event). These files, called the *Events* and *Results* files are formatted using the data dictionaries defined in Chapter 7 of the DMRG. When formatting the two files, the vertical bar typically found on the same key as the back-slash is used to delimit the fields. This vertical bar is called a "pipe", and so the text files are commonly known as "pipe-delimited" text files. It is important to use the "pipe" because there is a chance that other commonly used delimiters will be used in the "Comments" field and therefore cause a problem when loading the fields into a database. The text files should only contain the data and no header rows, since these are problematic for the SWQMIS loader program.

Coding Data (Tag_id, Tag Prefix, Submitting Entity, Collecting Entity, and Monitoring Type)

The *Tag_id* is a unique alphanumeric identifier for each sampling event that links the sampling event in one file to the measurement values in the other file, in a one-to-many relationship. The *Tag Prefix* is the unique one or two digit letter code added to the beginning of the *Tag_id* and identifies the Basin Planning Agency that is preparing the data set.

Submitting Entity codes identify the agency listed in the QAPP as the entity responsible for submitting the data to the TCEQ (QAPP Entity), *Collecting Entity* codes identify the organization responsible for collecting the data (field entity), and *Monitoring Type* codes identify the type of monitoring under which the reported data was collected.

Example: SR|LW|RT means the data was submitted under the Sabine River Authority (SR) QAPP, and collected by the City of Longview (LW) without targeting any certain environmental condition (RT). The *Tag* prefix would be "J" which is assigned to the Sabine River Authority.

Lists of valid codes can be found in Chapter 4 of the DMRG at:

www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wdma/dmrg_index.html.

Biological Electronic Data Reporting

Electronic reporting of biological data represents a special case in that the sum of the sampling should be reported as separate events: field, benthics, nekton, and habitat. Each of these sampling events have unique *Endtime* and *Starttime* information and different composite information. In order to relate the events to each other, a comment should be included in the *Comment* field of each event which references the *Tag_id*(s) of the other events (e.g. "see X023847 for habitat data, X023848 for nekton data").

Composite Samples

Composite samples require entries in several additional fields in the *Events* file. These fields are *Startdate*, *Starttime*, *Startdepth*, *Category*, and *Type*. *Category* must be one of four codes: *T* for time composites, *S* for space composites, *B* for both space and time composites, or *F* for flow-weighted composites. The *Type* field must be a two-digit number (including leading zeros, if necessary) indicating the number of grabs, *CN* for continuous, or *GB* when the number of grabs is unknown.

Data Review and Validation

The data review and validation process combines the data validation and verification requirements defined in Task 2 with those outlined in this task. The major considerations for this process involve checks for reasonableness and verifying that quality control limits were met. Data that does not meet

specifications of the QAPP will not be submitted to the TCEQ. Each anomaly that causes a data point to not meet QAPP specifications will be described in the *Data Summary* (Exhibit 4B).

Validating Outliers

The TCEQ establishes a minimum and maximum value for each parameter above or below which a value is considered an “outlier” by the TCEQ. The min/max values represent a statistically derived range based on historical data (e.g. 1st and 99th percentile). Reported values that are found to be outliers should be checked against field and laboratory records to verify the correctness of the value as described in Task 2. The Planning Agency Data Manager should ensure that these outliers are flagged in the data set to show that they have been confirmed. If an outlier is not flagged, the SWQMIS data loader will find the anomaly and will not accept the data. All outliers must be flagged in the *Results* file by the inclusion of a “1” in the *Verify_flg* field.

A file containing all parameters and their min/max levels (*sw_parm*) is updated monthly and made available for download on the CRP web page. Planning Agencies should ensure they have the most recent version of *sw_parm* when preparing data for submittal. The web page is located at: (www.tceq.state.tx.us/compliance/monitoring/crp/data/crp-resources.html).

Data Review Checklist

The *Data Review Checklist* (Exhibit 4A) covers three main types of review: data format and structure, data quality review, and documentation review.

The *Data Format and Structure* section includes checks for required entries and formats. This section can be automated by developing a computer program that checks the database for outliers, other data anomalies, and some types of data transcription errors. This includes checks such as:

- Are there any duplicate *Tag ID* numbers and are *Tag Prefixes* correct?
- Are the sampling dates in the *Results* file the same as the one in the *Events* file for each *Tag ID*?
- Are the codes for *Submitting Entity*, *Collecting Entity*, and *Monitoring Type* consistent with the entity and type of monitoring conducted during that period?
- Are the sampling dates and times in the correct format with leading zeros (MM/DD/YYYY) and (HH:MM)?
- See the Data Review Checklist and Summary, Exhibit 4A, for a complete list.

The *Data Quality Review* section includes checks specific to the acceptability of the data. This requires a more in-depth review of the data by personnel that understand the results of the laboratory analyses. This section includes checks such as:

- Are the required reporting limits consistent with those in the QAPP?
- Have outliers been confirmed and a code entered into the *Verify_flg* field?
- Do the laboratory results appear reasonable and acceptable when compared to other corollary data, or when other checks for correctness of the analysis are applied?
- Are all sampling sites defined in the QAPP?
- Are all Parameter Codes in the QAPP?
- See the Data Review Checklist and Summary, Exhibit 4A, for a complete list.

The *Documentation Review* section includes checks of the quality control information that is developed and provided by the laboratory or field staff. This section includes checks such as:

- Are blank results acceptable as specified in the QAPP?
- Were control charts used to determine the acceptability of field duplicates?
- Were there any failures in field and laboratory measurement systems that were not resolvable and resulted in unreportable data?
- Have any anomalies been reported on the *Data Summary*?
- Was the Laboratory's NELAC Accreditation current for the analysis conducted?

Submitting Data to the TCEQ

Water quality data will be submitted to the TCEQ in pipe-delimited ASCII text files without a header row (as specified in Chapter 7 of the *Data Management Reference Guide (DMRG)*) as a deliverable **at least** three times per year. The deliverable will be due on March 1, August 1, and December 1 of each year. The March 1 date will ensure that all the data collected through November 30th of the prior calendar year will be submitted to the TCEQ for use in the *Texas Water Quality Inventory and 303(d) List*. The August 1st date will ensure data is submitted prior to the close of the fiscal year, and the December 1st date ensures the TCEQ has an updated water quality database. The data submitted to the TCEQ needs to be up-to-date and therefore, each data submittal will include data collected no more than eight months prior to submission.

All data should be sent directly to the TCEQ CRP Project Manager via email. Each data submittal must be accompanied by a *Data Summary* (Exhibit 4B) which explains data discrepancies (e.g., missing measurements), describe field and lab issues, and indicates whether the *Corrective Action Process* has been initiated. *Corrective Action Plans* relating to the missing measurements will be submitted with the Progress Report after they are finalized.

TCEQ Data Review

TCEQ Automated Data Checks

The TCEQ performs an automated review of the data that encompasses both formatting, certain data validation, and error checks. When a data set is received by the TCEQ CRP Data Manager, a thorough check is performed to ensure the data format is compatible with SWQMIS requirements and any data anomalies are addressed before a data review can be performed. Some of the specifications include requirements described in the Table 3-11 of the *SWQM Procedures Manual, Chapter 3* relating to significant figures, rounding, and reporting to the nearest tenth, for certain parameters. Other requirements include outlier checks for each parameter, and formatting fields to match data structures.

After the automated review of the data set is complete, a list of errors is generated that indicates those records that need correction. The CRP Project Manager then provides the list of errors to the Planning Agency for correction, verification, and data resubmittal to the CRP Project Manager.

TCEQ CRP Project Manager Data Review

After the initial automated review is complete and the data set no longer contains any detectable errors, a "Loading Validator Report" is provided to the TCEQ CRP Project Manager that contains:

- Date Range
- *Tag_id* Range



- Count of records in the data set
- *Parameter codes* submitted with the data set and the number of times each was reported
- The minimum and maximum values submitted for each *Parameter code*
- *Station/IDs* for which data was submitted
- Number of events at each station
- *Submitting Entity / Collecting Entity / Monitoring Type* codes in the data set
- Outliers in the data set
- A comparison of data reported against the historical statistics at each station

The *Loading Validator Report* is then compared to the respective QAPP, Progress Report, and Data Review Checklist and Summary to reconcile expected versus actual results. One of the most critical steps in this review is checking whether the required reporting limits listed in the QAPP correspond to the minimum values submitted in the data set. When discrepancies exist, the CRP Project Manager will ask the Planning Agency to reconcile the differences and make corrections as necessary. This may require additional review of the QAPP when methods, Parameter codes, or required reporting limits are changed. When all errors and discrepancies have been reconciled, the data set is approved for upload to SWQMIS.

Other Data Management Considerations

Creating New Sampling Stations and New Codes

Requests for the creation of new monitoring stations will be handled via an internet connection to the SWQMIS interface. Each Basin Planning Agency has been given access to the Monitoring Stations Module as well as the Reports Module of the SWQMIS interface. Specific instructions for requesting new sampling stations is included in Section 4.3 of the SWQMIS User's Guide at:

<http://rhwwprd.tceq.state.tx.us/SwqmisWeb/help/output/index.htm>.

Requests for new codes relating to Submitting Entity, Tag Prefix, Collecting Entity and parameter codes should be coordinated with the CRP Project Manager. The Monitoring Type codes have been set for specific data use purposes, and new ones are created only if there is a strong business need. Lists of the existing codes are available in the DMRG. The forms for submitting the requests can be found at:

http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wdma/wdma_forms.html.

Data Correction Requests

If the Basin Planning Agency finds that water quality monitoring data are in error in its database, this fact should be communicated to the TCEQ so that the same corrections are made in SWQMIS. A SWQM Data Correction Request Form should be used to specify the applicable corrections. The forms should be submitted electronically to the CRP Project Manager. The form can be obtained from the Internet at:

http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wdma/wdma_forms.html.

If a large number of errors or systematic errors are found which make use of the form unreasonable, contact your CRP Project Manager for alternate electronic reporting methods.



Data on Basin Planning Agency Web Pages

The Basin Planning Agency should make current data available to the public, and include TCEQ-collected data if feasible (a disclaimer should be provided on the website if the complete dataset for the basin is not available). Newly available data should be added to the web at least twice annually. The Basin Planning Agency may choose to provide a link to the TCEQ water quality data to satisfy this deliverable.

CRP Data Management Training

The TCEQ may conduct data management training workshops, as needed, in response to new data management procedures or requirements. These workshops will typically be held in conjunction with other CRP training.



Exhibit 4A

Data Review Checklist



EXHIBIT 4A DATA REVIEW CHECKLIST

This checklist is to be used by the Planning Agency and other entities handling the monitoring data in order to review data before submitting to the TCEQ. This table may not contain all of the data review tasks being conducted.

Data Format and Structure	✓, X, or N/A
A. Are there any duplicate <i>Tag Id</i> numbers in the Events file?	
B. Do the <i>Tag</i> prefixes correctly represent the entity providing the data?	
C. Have any <i>Tag Id</i> numbers been used in previous data submissions?	
D. Are TCEQ station location (SLOC) numbers assigned?	
E. Are sampling <i>Dates</i> in the correct format, MM/DD/YYYY with leading zeros?	
F. Are the sampling <i>Times</i> based on the 24 hour clock (e.g. 13:04) with leading zeros?	
G. Is the <i>Comment</i> field filled in where appropriate (e.g. unusual occurrence, sampling problems, unrepresentative of ambient water quality)?	
H. <i>Submitting Entity, Collecting Entity, and Monitoring Type</i> codes used correctly?	
I. Are the sampling dates in the <i>Results</i> file the same as the one in the <i>Events</i> file for each <i>Tag Id</i> ?	
J. Are values represented by a valid parameter code with the correct units?	
K. Are there any duplicate parameter codes for the same <i>Tag Id</i> ?	
L. Are there any invalid symbols in the <i>Greater Than/Less Than (GT/LT)</i> field?	
M. Are there any <i>Tag Ids</i> in the <i>Results</i> file that are not in the <i>Events</i> file or vice versa?	
Data Quality Review	✓, X, or N/A
A. Are all the "less-than" values reported at the LOQ? If no, explain in the Data Summary.	
B. Have the outliers been verified and a "1" placed in the <i>Verify_flg</i> field?	
C. Have checks on correctness of analysis or data reasonableness been performed? e.g.: Is ortho-phosphorus less than total phosphorus? Are dissolved metal concentrations less than or equal to total metals? Is the minimum 24 hour DO less than the maximum 24 hour DO? Do the values appear to be consistent with what is expected for that site?	
D. Have at least 10% of the data in the data set been reviewed against the field and laboratory data sheets?	
E. Are all parameter codes in the data set listed in the QAPP?	
F. Are all stations in the data set listed in the QAPP?	
Documentation Review	✓, X, or N/A
A. Are blank results acceptable as specified in the QAPP?	
B. Were control charts used to determine the acceptability of field duplicates?	
C. Was documentation of any unusual occurrences that may affect water quality included in the <i>Event</i> table's <i>Comments</i> field?	
D. Were there any failures in sampling methods and/or deviations from sample design requirements that resulted in unreportable data? If yes, explain in Data Summary.	
E. Were there any failures in field and/or laboratory measurement systems that were not resolvable and resulted in unreportable data? If yes, explain in Data Summary.	
F. Was the laboratory's NELAC Accreditation current for analysis conducted?	

✓ = Yes X = No N/A = Not applicable



Exhibit 4B

Data Summary



TASK 5: DATA ANALYSIS AND REPORTING

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TASK 5: DATA ANALYSIS AND REPORTING

Introduction

The data analysis and reporting efforts outlined under this task include the examination of water quality issues throughout the basin so that a more complete understanding of water quality conditions may be generated and communicated to all the basin's stakeholders. The information in these reports will help shape decisions and the focus of work in the basin.

The major deliverables due as a part of this task are two different Water Quality Reports:

- Basin Highlights Report (annually, except when Basin Summary Report is due)
- Basin Summary Report (every 5 years)

Basin Highlights Report

The Basin Highlights Report provides an update on water quality status and Clean Rivers Program activities during the prior year. The report is due each year, except in those years when the Basin Summary Report is due.

The Basin Highlights Report provides information to more fully understand why *Concerns* and *Impairments* exist in each segment of the basin. This document needs to be both user-friendly and accessible to a wide audience; therefore, document layout and discussion should provide information in a manner that explains why conditions exist. In this effort, it is important to get steering committee input on the format and content of the document prior to its finalization. This report differs from the 5-year Basin Summary Report in the extent and presentation of the technical data analysis. The Basin Highlights Report provides information on activities of the past calendar year, and a narrative to describe water quality issues, whereas the Basin Summary Report involves detailed discussion of the findings from a comprehensive data analysis to help set priorities, describe water quality throughout the basin, and identify trends.

An outline for the Basin Highlights Report is provided in Exhibit 5A with some examples of satisfactory text attached. The report should include, at a minimum:

- an overview of basin water quality monitoring describing each organization's participation
- the top water quality issues in the basin for stakeholder prioritization and monitoring decisions
- a description of water quality conditions for each segment/waterbody
- a summary of findings from special studies
- maps showing the location of sampling sites and water quality issues
- Steering Committee and other public outreach activities
- instructions on how to get involved in steering committee meetings, volunteer monitoring, and other opportunities for participation
- information on the CRP content featured on the Planning Agency's Web site.

The Basin Planning Agency can choose to reduce the content in odd-numbered years in an effort to reduce any unnecessary repetition of information that does not change on an annual basis. The reduced version can be designed to update stakeholders on activities in a brief program update (minimum of 2



pages). An addendum to the report in odd-numbered years will provide information for the TCEQ staff to use in preparation for the next TCEQ assessment (*Water Quality Inventory and 303(d) List of Impaired Waters*). The addendum to the report will contain information describing possible sources and causes of *Impairments* and *Concerns* on the latest TCEQ assessment. An outline for this addendum is provided in Exhibit 5B. This is being done to assist TCEQ in completing their work by providing “on-the-ground” reconnaissance and local knowledge of the watershed surrounding the water body. Information describing data anomalies, results of data analysis, flow status, and even suggested future work will also be included where available. The addendum does not have to be attached to the Basin Highlights Report and can be sent at a different time to the TCEQ since it is dependent upon receipt of the table from the TCEQ.

Five copies of the draft report and five copies of the final report are to be submitted to the TCEQ Clean Rivers Program (CRP) Project Manager. The Basin Highlights Report will be posted on the Planning Agency’s Web site and mailed to basin steering committee members.

Basin Summary Report

The Basin Summary Report is designed to provide a comprehensive review of water quality data and related information for each river and coastal basin in Texas. This report serves to develop a greater understanding of water quality conditions and enhance the ability to make decisions regarding water quality issues. The report is completed once every five years for each river and coastal basin based upon the rotating basin permitting cycle. For this biennium, the Summary Report is due in 2010 for the Neches, Neches-Trinity, and Trinity basins, and in 2011 for the Trinity-San Jacinto, San Jacinto, San Jacinto-Brazos, and Brazos-Colorado basins. The following items specify logistical requirements for the Basin Summary Report:

- A planning meeting with the Texas Commission on Environmental Quality (TCEQ) CRP Project Manager to discuss the format and organization of the report is required prior to significant work on the report to ensure objectives are met.
- A copy of the final report needs to be made available to each stakeholder. This may be accomplished by: handing out copies at the steering committee meetings, putting the report on the Internet, and mailing notices of its availability in hard copy upon request.
- Five copies of the draft report and five copies of the final report are to be sent to the TCEQ CRP Project Manager.
- At a minimum, the Executive Summary and maps of water quality issues should be posted to the Planning Agency’s CRP Web page.

From the Texas Water Code, Section 26.0135, Clean Rivers Act, the summary report must:

- be sent to the State Soil and Water Conservation Board and Parks and Wildlife Department
- identify water quality concerns, impaired or potentially impaired uses, the cause and possible source of use impairment, and recommended actions the commission may take to address those concerns
- discuss the public benefits from the water quality monitoring and assessment program, including efforts to increase public input in activities related to water quality and the effectiveness of targeted monitoring in assisting the permitting process
- be approved by the basin steering committee and coordinated with the public and the commission
- include a review of wastewater discharges, nonpoint source pollution, nutrient loading, toxic materials, biological health of aquatic life, public education and involvement in water quality issues, local and regional pollution within the watershed
- identify significant issues affecting water quality



and with respect to the assessment each Planning Agency shall:

- identify water quality problems and known pollution sources and set priorities for taking appropriate action regarding those problems and sources
- recommend water quality management strategies for correcting identified water quality problems and pollution sources
- inform those parties (persons who pay fees under Section 26.0291 and steering committee members) of the availability and location of the summary report for inspection and shall solicit input from those parties concerning their satisfaction with or suggestions for modification of the summary report
- summarize all comments received from persons who pay fees under Section 26.0291 and from steering committee members and shall submit the report and the summaries to the governor, the lieutenant governor, and the speaker of the house of representatives not later than the 90th day after the date the river authority submits the summary report to the commission and other agencies

Content

The outline and description of content for the Basin Summary Report can be found in Exhibit 5C - Basin Summary Report Outline. The outline is provided to ensure content is consistent from basin to basin; however, the information may be presented in different ways. Input from users of the report has been favorable when all the information specific to a watershed is presented cohesively so as to get a more complete picture of a watershed's water quality. This report should answer the questions most stakeholders have, which tend to be:

- ▶ what are the water quality issues?
- ▶ why do the issues exist?
- ▶ what are the possible effects?
- ▶ what should be/could be done about it?

Exhibit 5C provides an explanation and illustration of how the various data review and analysis methods can be combined to provide an overall description of water quality by answering the questions listed above. The data review and analysis methods that can help answer the questions include: descriptive statistics (percentiles), trend analysis (changes over time), and spatial analysis (differences from upstream to downstream, and watershed characteristics).

Goals of the Report

This report serves to provide an explanation for why current water quality conditions exist by incorporating and interpreting the findings from the various data analysis functions. By explaining the findings, we can better describe the reasons for the problem so that something can be done with the information.

The information from the review will support the following functions:

- develop monitoring plans and update priorities
- enhance knowledge and understanding of water quality issues
- verify and explain findings on the State's Water Quality Inventory
- correlate water quality conditions with possible sources
- prioritize water bodies for action
- select watersheds for special studies
- highlight those sections of the basin that need more land use information
- assess the success of water quality improvement projects

Watershed Characteristics Reference Information

In order to adequately analyze a water body, or watershed, knowledge of the factors influencing water quality is needed. It is important to regularly maintain information that will support this understanding. As new information is learned about a water body, or watershed, it can be added to the databank of information. This information can then be referenced to support the results of the water quality data review for inclusion in the reports. This information would best be maintained as mini fact-sheets about water bodies and their watersheds and could incorporate the Events Inventory. The deliverable for this work will be shown as descriptive information about sources and causes in the reports and in the deliverable in Exhibit 5B titled, *Information for Impairments and Concerns*.

Some of the information that should be maintained for each water body and its watershed, includes:

- ▶ hydrologic characteristics (e.g., streamflow variability, reservoir dynamics, seasonality, typical flows)
- ▶ natural characteristics (e.g., topography, slope, soils, vegetation, wildlife, average annual precipitation, average high and low temperatures, eco-regions)
- ▶ land use (e.g., estimate amount of crop land, rangeland, urban, forest; septic tank concerns; predominant crop types; urban/residential nonpoint source, landfills, industrial areas; quarry operations; oil/gas operations,)
- ▶ discharge to surface waters (e.g., industrial & municipal dischargers, discharge amounts, CAFOs, storm water permits)
- ▶ future changes anticipated in factors that affect water quality (e.g., population changes, increased number of industrial facilities)

Information for Impairments and Concerns

In order to support the TCEQ in its assessment of water quality, certain information will be provided to the TCEQ in the Spring of odd-numbered years. This information will be useful in providing the information needed to better characterize and understand water quality issues. Information such as flow status, possible sources in the watershed, possible reasons for water quality issues to occur, and data anomalies will be provided in a table. A template table will be provided to the Planning Agencies from a database maintained by the TCEQ and will contain all the *Impairments* and *Concerns* from the latest approved TCEQ assessment report. The Planning Agencies will then fill in or change the information in the table to help populate the TCEQ database. When not enough is known about a water body and its related issue, then the table may be left blank for that water body. It will be important for the Planning Agency to research those issues in preparation for the next assessment. This type of information should be acquired through stakeholder input as well as investigation. The information for this table should be reconciled with the Watershed Characteristics Reference Information. An example table is provided as Exhibit 5B which may not follow the format of the template, so additional fields may be added to the template to capture the information needed to explain the water quality issue.



Events Inventory

An inventory of one-time and seasonal events may be used to describe changes in water quality conditions. Events are defined as those occurrences that have the potential to either positively or negatively impact water quality. This information may be collected and developed for the entire river basin or just within watersheds under special study. The inventory can be used to help explain changes in water quality, or highly elevated values over short periods of time. The inventory may be useful in determining where improvements to water quality are expected and, when coupled with water quality trends, may indicate the reason for improvement. Over time, a watershed may experience more events (such as fertilizer or pesticide application) during certain seasons that will help focus monitoring to address those concerns.

Examples of events include:

- implementation of nonpoint source best management practices (NPS BMPs)
- new wastewater treatment plant or a change to effluent limits
- floods and droughts
- complaints about failing septic systems
- fish kills
- new land application of sludge
- seasonal crop fertilization or application of pesticides
- spills in or near water bodies

The events data can be collected by the Planning Agencies from local governmental organizations, such as city or county health departments. Other sources may also include media coverage, Steering Committee and/or stakeholder input, and state agencies that conduct and oversee the implementation of water quality related issues.

Updates to the inventory will be provided once each year in tabular format, by date and watershed. Additional effort to collect historical events data is necessary for priority watersheds to help in analyzing water quality data collected for special studies. The table or database for the events inventory should include watershed name, stream segment number, type of event, date or date range, the active participants, and a short description of the location. An example table is shown below.

Example Events Inventory

North Fork Elm Creek Watershed Segment No. 1240		
Event	Date	Location/Participants
Wastewater plant abandoned	02/1999	Gary Job Corps
NPS BMP - Composting Poultry Waste	05/1997-05/1999	Southwest Milam County/ 5 Agricultural Operations
New Stormwater Permit	07/2000	Brazos River downstream of the City of Waco
Fish Kill	08/2000	Little River downstream of Thattown
New Wastewater Permit 13097-001	11/2001	City of Mexia

This deliverable is optional for this biennium due to resource constraints throughout the program. The level of effort for this work can be determined by the Planning Agency through discussions with the CRP Project Manager and described in the work plan.



Exhibit 5A

Basin Highlights Report Outline and Examples

EXHIBIT 5A

BASIN HIGHLIGHTS REPORT OUTLINE

This Year's Highlights

- What were the major events or occurrences during the previous year (positive and negative)?
- What major issues (e.g., extreme drought, increasing development, confined animal operations, ongoing issues, natural salt pollution, record flood) are plaguing water quality for the basin?
- How have these events impacted water quality?
- What has been done to respond to water quality issues?

Water Quality Monitoring

This section involves a summarization of the monitoring that was planned, or occurred, during the past year including any participating entities and special projects.

- Present information on monitoring for the current fiscal year, to include:
 - Number of sites per entity, frequency, type of monitoring
- Map the coordinated monitoring schedule for the entire basin
 - Show and label sampling sites, water bodies, county boundaries, highways, & cities
- Explain what the water quality parameters mean and why they are important
- Provide a link to the web page that shows the entire monitoring schedule
- Highlight other organizations' participation in the monitoring program

Water Quality Conditions

The key to ensuring this portion of the report is adequate is to answer the questions the reader would ask, "why are levels elevated and what is being done about it?". When the answers to the questions are unknown and/or cannot be estimated, this information gap should be stated. If the previous year's report (including Basin Summary Report) contains a description of water quality for each TCEQ segment, and there is no new Water Quality Inventory, then this section can be copied from the previous year's report. A statement should be included that no new assessment information is available since the previous report. The examples provided after this outline are highly recommended.

Explain the TCEQ assessment and categorization process

- Explain the assessment and categorization methods used for the latest state-approved TCEQ Water Quality Inventory and 303(d) list and provide the web address for reference

Describe water quality

- For each segment/water body, provide a concise description of the key watershed and water body characteristics that draw a picture of water quality
- Indicate the status of the segment/water body on the latest TCEQ Water Quality Inventory and provide some possible reasons why there is a *Concern*, *Use Concern*, and/or *Impairment*.
- Highlight those water bodies that may have a water quality issue, or are significant due to size, location, or public interest, but which do not have a *Concern*, *Use Concern*, and/or *Impairment* and provide some possible reasons why the water quality is an issue.

Provide information on current or proposed work in the watershed

- Monitoring activities done in response to a water quality issue
- Proposed monitoring needed to better describe water quality (e.g., diel sampling for 2 years; monthly sampling for bacteria under a variety of flow conditions for 2 years; collect TDS in subwatersheds throughout the affected watershed to identify source areas)



- Describe special studies, activities to date, and any findings (reference special study reports that have been completed or will be completed in the near future)
- Accomplishments in the past year, or several years (e.g., 100 wells have been capped; 100,000 tons of manure have been composted and hauled out of the watershed; riparian buffers restored on over 15 miles of stream banks)

Map water quality issues

The map(s) should be at a scale that allows the reader to recognize where sampling sites and water quality issues are located in relation to major landmarks. In some cases, it may be useful to show the location of factors influencing water quality, such as wastewater treatment plants, CAFOs, and row-crop operations in order to show their spatial relationship to the water quality conditions and the sampling sites.

- Highlight segments or sections of segments with water quality issues (e.g. *Concerns, Use Concerns, and/or Impairments*)
- Include and label, at a minimum: streams/reservoirs, county boundaries, highways, cities, and segment boundaries

Special Studies

This section is optional and may be incorporated into the previous section. It is also useful to reference study reports and fact sheets for more detailed information.

- Describe special studies in process and any findings to date
 - Include information on why the special study was needed, the outline of the study's scope, the type of monitoring that is being done, and the results of data collection.

Stakeholder Participation & Public Outreach

- Describe opportunities for involving other monitoring entities in the program
 - Who is currently involved? What is their contribution?
- Explain the purpose of Steering Committee meetings (e.g. forum for providing input on water quality issues, establishing priorities for future work, and providing feedback on reports)
- Include a section on how individuals and organizations can get involved in the program
- Outline efforts that have been taken to get more involvement in the program
- Summarize prior Steering Committee discussions
- Summarize volunteer monitoring activities in the basin
- Include information on volunteer organizations and their activities, with contact information

Web Site

- Provide an overview of the information available on the web site
- Provide links to important pages, especially those with further detail on issues discussed in this report and those that allow the public to check on upcoming events



EXAMPLE TEXT FOR THE BASIN HIGHLIGHTS REPORT

This Year's Highlights

Example # 1:

Since its inception in 1934, the River Authority has served to protect surface water resources in the river basin. Today, the River Authority's mission is enhanced through partnerships with the TCEQ, the River Authority, and the Upper River Authority.

The partnerships are fostered by the Texas Clean Rivers Program, which provides funding and guidance to achieve the shared goal of clean water for future generations of Texans. This report highlights the activities of the River Authority and its CRP partners for 2000.

The most significant factor affecting water quality throughout the basin in 2000 was the severe drought. In the upper portion of the basin, much of the River east of the City went completely dry, forcing some residents to transport water to storage tanks at their homes. The decreased flows resulted in elevated chloride levels in the river above the reservoir. In the middle portion of the basin, the Lake was 21 feet below average in August, a level not seen since 1984. The river at State Highway 180 also went dry.

In November and December 2000, base flows returned to the River and many of its tributaries. The rains came with a cost, however. During one particularly heavy rain, approximately 37,000 fish were killed in the River when stormwater runoff transported pollutants that depleted the oxygen supply in the river.

Probably the most dramatic event took place in the middle basin in November when Lake #2 rose 40 feet in 13 days to capacity by December 1.

The upper portion of the basin has seen little relief from the drought. Small inflows into the lakes were not sufficient to increase water levels significantly. The capacity at Lake #3 in April 2001 was 12 percent, decreasing from 14.2 percent in 2000. Reservoir #1 gained eight feet of elevation, primarily due to one rainfall in March 2000. Reservoir #2 was at 17 percent of its capacity in April 2001.

Example #2:

The major events relating to water quality that occurred this year include the updated State of Texas Water Quality Inventory, the completion of the first year of the Reservoir #1 Water Quality Monitoring Program, the initiation of the dissolved metals study, identification of a leaking sewer main, improvements to the City #2 wastewater collection system, and a new fish consumption advisory for Lake #4.

The State's Water Quality Inventory identified eight new concerns (3 for nutrients, 3 for dissolved oxygen, and 2 for pH) and 5 new impairments (3 for bacteria and 2 for dissolved oxygen). Several historical data points for metals were removed from the assessment due to out-dated methodologies, therefore a dissolved metals in water study has been designed to verify whether there are any metals in water issues in the basin. Fifteen historical, long-term monitoring stations will be monitored quarterly for dissolved metals in water. At the end of the study period, the basin will have sufficient metals data to properly assess the levels of metals in water in most segments.

The Reservoir #1 Water Quality Monitoring Program was developed to address growing concerns over water quality conditions due to wastewater treatment facilities at the local papermill. Significant improvements in wastewater discharge from the papermill should help water quality in the long-term. In addition, the papermill is in the process of renovating its wastewater treatment facility to significantly reduce waste loads.

Example #3 (a portion of):

For fiscal year 2002, the River Authority has added four routine and three flow sites to the monitoring plan. Three of the routine sites are on River #1. These sites were added in response to concerns about water quality impacts resulting from increased public use of the river. The fourth site was added downstream of a petrochemical plant on the River #2. A polluted groundwater plume has been identified very close to the river. Efforts have been made by the plant to keep the plume from entering the river.

In addition, three sites were added to monitor flow on a monthly basis for one year to enable calculations to be made for wastewater effluent assimilative capacity. This data will replace assumptions made by the TCEQ when assigning allowable permit effluent limits.



EXAMPLE TEXT FOR THE BASIN HIGHLIGHTS REPORT

Water Quality Monitoring

Number of Sites Monitored						
Sampling Entity	Field	Conventional	Bacteria	Biological and Habitat	Metals in Water	Organics in Water
River Authority	20 monthly 8 quarterly			10 semi-annually	9 annually 1 semi-annually	2 semi-annually 2 quarterly
River Authority 2	11 quarterly		11 quarterly 19 weekly (May - Aug)	9 semi-annually	2 annually	
TCEQ	23 quarterly				5 annually 4 semi-annually	1 semi-annually
City	4 quarterly					

In addition to the routine and systematic monitoring sites, there are three special studies which include: metals in water quarterly at 15 sites, petroleum related products monthly at 3 sites, and conventional and field parameters monthly at 6 sites.

What are the Water Quality Groups?

Field - physical and chemical water quality characteristics that can be measured on-site, and generally include: dissolved oxygen (DO), conductivity, pH, temperature, stream flow, flow severity, secchi disc, and field observations/conditions.

Conventional - chemical and biological constituents in water that typically require laboratory analysis, and generally include: several forms of nitrogen, phosphorus, bacteria, chlorophyll-a, total dissolved solids, and total suspended solids.

... etc.

What is Dissolved Oxygen and Why is it Important?

Dissolved oxygen (DO) indicates the amount of oxygen available in the stream. Certain minimum concentrations are needed to support aquatic life. DO can be reduced by a number of factors such as elevated water temperatures and the loading of organic substances that require oxygen for decomposition (e.g., plant debris and wastewater effluent).

Why do we collect nutrients?

To determine compliance with water quality standards that are set by the TCEQ to protect human health and to determine if there is an unnatural loading of nutrients. High levels of nutrients can cause excessive plant growth which can lead to reduced dissolved oxygen in the stream, in turn this can reduce the survivability of fish. In addition, at certain levels nutrients can cause an excessive growth of algae which can result in taste and odor problems in drinking water.

... etc.

EXAMPLE TEXT FOR THE BASIN HIGHLIGHTS REPORT

Water Quality Conditions

Segment #1 Watershed: This stream is a 2nd order perennial stream with flows ranging from 3 cfs during July and August to a normal flow of 17 cfs the rest of the year. Rice and cotton farming can be found throughout the watershed and the soils are typically a dark clay loam. The slope of the land is minimal, as expected in the central coastal plain. There are 12 domestic outfalls and six industrial outfalls. The TCEQ listed this stream for not attaining its contact recreation use due to elevated bacteria counts in the lower 50 miles. The stream is listed with concerns for having an impaired aquatic insect community and an impaired fish community. It is unclear whether the aquatic community is affected by the activities in the watershed. There is currently a systematic watershed monitoring study being conducted to collect data to further explain the cause of high bacteria in the watershed. A trend analysis was conducted for the years 1990-2000 showing a steady, small increase in temperature over that period. See the 2001 Basin Summary Report for more details.

Segment #2 Watershed: The streams in this watershed are characterized by perennial low flows ranging from 2 to 8 cfs. The area is in the blackland prairie where soils are a dark clay loam and the slope of the streams is minimal, causing pooling and periods of no flow with standing water. While over 80% of the watershed is undeveloped, the area is experiencing rapid growth toward the west. There are 59 domestic outfalls and two industrial outfalls. The segment is listed for not attaining its contact recreation use due to elevated bacteria counts as well as for low dissolved oxygen occurrence from SH 249 to IH 45. Low dissolved oxygen is also found in the Upper Branch and Upper Lake sub-segments. Ammonia is a concern along Upper Branch. High levels of other nutrients, including nitrite+nitrate-nitrogen, ortho-phosphate phosphorus, and total phosphorus, are found along the main stem. There have been numerous sewer line failures in the watershed as well as a great deal of urban and commercial land use increasing run-off and stormwater flow. It is possible that the elevated nutrients are related to the outfalls and the elevated bacteria is due to run-off and sewer line leaks.

Segment #3 Watershed: This 15-mile portion of the main stem of the River is a sluggish, sloshing, bayou-type tidal stream with a man-made salt water barrier preventing salt water from moving further inland. This section of the River is influenced by flow from the main stem of the River upstream as well as from the Other River. The soils are silty central coastal plains and the slope is minimal. There are several large industrial outfalls, no municipal outfalls, and very little population in the surrounding watershed. The TCEQ listed this site as not meeting dissolved oxygen criteria to support aquatic life; however, current methods for assessing grab DO samples against the absolute minima criteria shows that this segment supports its aquatic life use. There are four 24-Hour DO sampling events scheduled for fiscal year 2005 to help determine if aquatic life use is supported. There were no trends shown for dissolved oxygen for summer or winter. As expected, the lower values are seen during the summer months. The TCEQ also listed this site as not meeting the screening criteria set for nitrite+nitrate nitrogen. It is apparent from the graph that there is a large percentage of exceedances over the period of record. The most likely source of the high nutrients is from the Other River Basin whose confluence is three miles upstream. The Other River Basin data shows higher nutrient concentrations than the ambient levels shown in the main stem of This River upstream of the confluence with the Other River Basin.

Segment #4 Watershed: This 38 mile portion of the XYZ River, from City 1 to Hwy 3, is characterized by a bedrock stream bed, flows that average 15 cfs, an average to above average slope for Texas, stream banks with solid rock and limestone soils, 30 inches average rainfall, and a typical temperature range of 20 to 100 degrees F. Two small towns are found in the watershed with populations less than 5000 each. A great deal of housing and retail development is occurring throughout the watershed which can cause sediment run-off and greater flooding potential, while reducing infiltration for spring flows. In addition, the installation of water wells has the potential to cause a reduction in spring flows. In 2004, the TCEQ stated that water quality standards and screening levels are met for all available data. The River Authority's review of data over time (trend analysis) indicates that substantially elevated levels of Sulfates occurred during a period of drought in 1999. A special study was conducted to locate the source of the elevated levels and the likely source is groundwater coming from the Big Creek sub-watershed. No biological or toxic data has been collected in this stretch of the river.

EXAMPLE TEXT FOR THE BASIN HIGHLIGHTS REPORT

Special Studies

Example #1

Creek #3 - Success Story: With such a broad array of bacteria problems in the region, trying to identify specific sources can be challenging. Looking at small tributaries that feed into larger bayous in the area is a good start to determine where the sources are located so that actions can be taken to prevent excessive bacteria from entering the water.

Some tributaries of Creek #3 were sampled for bacteria and were found to exceed the contact recreation standards. The small size of the tributaries (~1.6 miles long) allowed TCEQ staff to easily investigate the situation. Staff encountered three illegal bypass lines running from manholes to the area collection system and every manhole along the creek had sewage debris around it. Residents indicated that this has been a long-term problem. Raw sewage was flowing from one of the bypass lines while the TCEQ investigator was on the site. While a bacteria sample collected upstream showed 90 colonies/100 ml of water, an outfall 160 feet downstream exhibited 300,000 + colonies/100 ml of water.

The illegal lines have now been removed and the City is expanding the force mains and two lift stations to address any overflows. The collection system in the area will be reevaluated.

TCEQ staff will be evaluating data from other tributaries shown to have bacteria problems and initiate similar investigations for sources. As these problems are corrected, bacteria loads to the main stem will decrease.

The small tributary approach is an excellent step toward addressing bacteria issues with a minimal amount of data collection.

Example #2

Creek #4 - Volatile Organic Compounds: Water samples from a portion of Creek #4 have shown levels of the volatile organic chemicals 1,2-dichloroethane and 1,1,2-trichloroethane.

The Industry #1, Inc. waste site is an abandoned refinery located on approximately fifty-eight acres along Creek #4a, a tributary to Creek #4. The facility was operated from the late 1950's until 1982. Chemical spills at this facility have entered Creek #4a and contaminated soils and groundwater. Groundwater from the site is pumped, treated, and discharged to Creek #4a under a U.S. EPA Record of Decision amended in 1997. This discharge and direct migration of contaminated groundwater to Creek #4a are believed to be the only significant continuing sources of the VOCs to Creek #4. Concentrations are now below the water quality targets for protection of the fish consumption use. As a result, the Texas Department of Health has rescinded the health advisory. Continued periodic monitoring will be required to confirm that concentrations of volatile organic compounds in Creek #4a and Creek #4 water do not exceed the water quality targets. Additional monitoring of the VOCs in fish tissue will be required to verify that fish continue to be safe for consumption.



EXAMPLE TEXT FOR THE BASIN HIGHLIGHTS REPORT

Stakeholder Participation & Public Outreach

Focus on Outreach

This River Authority's Clean Rivers Program public outreach activities include involvement of stakeholders and committee members planning and analysis of watershed management as well as watershed and water quality education for the public.

There are three main groups that help set priorities and direct water quality assessment activities for the program. They include a Steering Committee, a Technical Advisory Group, and a Regional Monitoring Workgroup. For more information on the roles of these committees and how to get involved, please visit:

www.abcdefg.abcd.tx.us/intro/introcmte.html

The River Authority has instituted several new approaches to educating the public about watersheds and water quality throughout the region. While continuing to participate in environmental festivals and outdoor events, the River Authority has also devised ways to reach others who may not attend or have access to those types of events.

One approach has been through direct mailouts. A brochure that summarizes Watershed #1 was mailed out randomly to approximately 3,000 residents in that watershed. Enclosed in the mailing was a postcard response survey that asked the recipient:

- 1) How familiar they were with the concept of a watershed,
- 2) Before receiving this document, did they know they lived in Watershed #1?, and
- 3) Had they learned anything new about the health of the aquatic environment from the information provided.

Many of the cards received indicated that the recipient had never heard of the watershed concept, did not know they lived in Watershed #1, and did learn something about the health of the aquatic environment. In addition, almost half of the recipients who returned their survey cards requested more information.

How Do I Get Involved?

- Learn more about how to prevent nonpoint source pollution, request a FREE copy of our brochure, "What Watershed Do You Live In?"
- Be aware of local laws and ordinances that aim to protect our waterways
- Report spills, fish kills, or illegal dumping to TCEQ's Pollution Hotline at 1-800-3OURBAY or to Texas Parks and Wildlife at 281-842-8100
- Volunteer to monitor a nearby creek or lake. Join the River Authority Texas Watch team, please visit: www.abcd.123
- Volunteer for other activities such as the annual Trash Bash, which aims to remove thousands of pounds of trash from area waterways, visit www.trashbash.org
- Check out our Data Clearinghouse for information, interactive maps, online databases, and more at: www.abcdefg.123.org
- Attend our next Clean Rivers Program Steering Committee Meeting which will be posted on our web site at www.abcdefg.123.steeringcmtmtgs.org

Web Site

The River Authority Clean Rivers Program web page contains a variety of different information. The Data Clearinghouse, www.abcdefg.123/waterdata, is full of information on watersheds, water quality, and includes other data resources.

The main features of the clearinghouse are: interactive mapping and customized water quality data query.

The complete 2001 Basin Summary Report, including trend analyses and detailed data reviews for each watershed, is available online at: www.abcdefg.123.resources/crp/watersheds.html

Special study summaries and reports are highlighted on the main CRP page at: www.abcdefg.123/intro.html.



Exhibit 5B

Information for Impairments and Concerns



EXHIBIT 5B Information for Impairments and Concerns

This document will be prepared in the Spring of odd-numbered years to support the completion of the *TCEQ Water Quality Inventory and 303(d) List*. Information will be provided for those water bodies with *Impairments* and/or *Concerns* on the prior TCEQ assessment report.

Water Body and Location	Flow Status	Parameter(s)	Possible Sources in the Watershed	Possible Reasons for Impairment and/or Concern	Special Study (Y/N)
Lavaca River upstream of Hallettsville	Intermittent with pools	Dissolved Oxygen	Two small towns <2000 pop. Two small WWTPs, 20/20, <0.5 MGD total Poultry operations Range land	Not enough flow during hot summer months when sandy substrate heats up.	TPWD/ LNRA 24Hr DO
Sulphur Creek at SH 183	Perennial	Bacteria	In downtown Lampasas, <3000 pop., above WWTP, near parks and golf course.	Run-off conditions show higher levels than rest of watershed. Steady state conditions are elevated, possibly related to water fowl, city sewer lines,	Y
Walnut Creek at IH-35	Intermittent-dry in summer for up to two weeks at a time	Bacteria Nitrate Dissolved Oxygen	In north Austin, >100,000 pop. in watershed.	Urban run-off, city sewer lines, low flows.	Continuous monitor
Plum Creek at Uhland	Perennial	Bacteria Nitrate	City WWTP, ~4MGD. Other smaller permits. None at capacity. City and rapidly growing urban development, >4000 in watershed. Rangeland, crop land.	Bacteria is elevated during steady state, and greatly accentuated during run-off, related to urban development and range/crop land. Nitrates may be in geology, but most of flow is City WWTP.	CRP-Y WPP- TSSWCB



Exhibit 5C

Basin Summary Report Outline



EXHIBIT 5C

BASIN SUMMARY REPORT OUTLINE

Executive Summary

The Executive Summary is intended to convey the essence of the larger summary report in a non-technical manner. The following is an outline for this overview:

Activities and Accomplishments - Describe the successes of the program and how the basin objectives have been accomplished over the past five years. Discuss how efforts undertaken with regard to monitoring (i.e., level of effort), geographic data sets, prioritization of water quality issues, efforts to involve basin stakeholders, and public outreach endeavors, have provided a benefit to the public.

Significant Findings - Summarize the results of the data analyses (e.g., number of sites with high levels of nutrients, positive and negative trends, and any hits with toxics). Describe major water quality issues and the most likely reasons for the water quality conditions. Highlight water quality that appears to be improving and report on any actions that have been taken to improve water quality.

Recommendations - Include specific recommendations for each watershed and explain the basis for the recommendation. Describe how the findings from the data analyses will be used to focus resources in the next biennium.

Summary Report

1.0 INTRODUCTION

The Introduction will provide the reader with the purpose of the report and sufficient background to understand the scope of the Clean Rivers Program (CRP) and the information provided within the report. The introduction will also include subsections with the following general headings:

- ▶ CRP and basin goals/objectives;
- ▶ coordination/cooperation with other basin entities;
- ▶ descriptive overview of the basin's characteristics, including key factors influencing water quality;
- ▶ summary of basin's water quality characteristics.

2.0 PUBLIC INVOLVEMENT

This section describes basin efforts to promote public involvement in water quality issues. Planning Agencies will summarize public information and education activities undertaken and evaluate the success of these activities. The report will also identify and discuss any public outreach materials developed (e.g., pamphlets for septic tank maintenance, NPS pollution education).

The basin Steering Committee needs to be discussed fully in this section. This may include a general description of membership, how the committee functions, and typical topics that are discussed at the meetings. This section should define how the committee's input is incorporated in decisions for focusing CRP resources (e.g., special studies, adding sites, adding parameters).

This section also should include efforts to seek public input for prioritizing water quality issues and monitoring projects, including Watershed Protection Plan/TMDL coordination efforts, review of stream

standards, the State's Water Quality Inventory, and basin planning initiatives. Where applicable, include a discussion on volunteer environmental monitoring (VEM) groups and the function of these groups.

If any watershed-based technical sub-committees have been formed, a short overview of the functionality of those committees should be provided. A more in-depth discussion of how a committee has been involved in a special study can be provided in the Watershed Summaries section of this report.

3.0 WATER QUALITY REVIEW

3.1 Water Quality Terminology

This section needs to provide a description of any technical terms, including monitoring parameters and how they relate to maintaining water quality standards. A short discussion of the quality controls behind the data should also be included.

3.2 Data Review Methodology

This section will include a discussion of the methods used to evaluate the data and should provide enough detail for the reader to be able to re-create your steps. Some of the process overviews include:

- an explanation of TCEQ's assessment methodology, along with how the State's information will be used in the report
- a discussion of the methods used to conduct the Trend Analysis specifying the parameters used to screen the data (e.g., number of records, period of record) and the criteria used to determine whether a trend exists (e.g., percent change per parameter)
- an explanation of any additional evaluation methods (e.g., compare descriptive statistics from site to site for similar watersheds to determine the relative level of concern; compare descriptive statistics upstream to downstream to find significant changes, then relate factors in the watershed to the change)
- a description of the index of biotic integrity used for biological surveys

3.3 Watershed Summaries

The review of water quality data and watershed characteristics should be presented within the context of a watershed to keep information for stations that are in close geographic proximity and subject to similar watershed characteristics together. For our purposes, a watershed is typically defined by a segment and the land/tributaries that drain to it. The following sections will make up each Watershed Summary (see Exhibit 5E for an example Watershed Summary) and will help answer the questions:

- ▶ what are the water quality issues?
- ▶ why do the issues exist?
- ▶ what are the possible effects?
- ▶ what should be/could be done about it?

Reviewing Water Quality

The first step in the review of water quality is to **identify water quality issues**. A water quality issue may be identified in one or more of the following ways:

- ▶ listed as an *Impairment or Concern* on the latest TCEQ *Water Quality Inventory and 303(d) List of Impaired Waters*
- ▶ local concern of stakeholders; and
- ▶ through the review and comparison of water quality data by the Planning Agency

Note: In those cases where there is no “identified water quality issue”, the report needs to include some discussion of water quality. The discussion should include an overview of the watershed characteristics, results from the latest TCEQ Assessment, and the descriptive statistics (e.g., percentiles) to show how they compare to other similar water bodies in the area.

Once a water quality issue has been identified through one of the methods listed above, a short description is needed explaining **why it was identified as an issue**. This could be stated in some of the following ways:

- ▶ Impaired/concern because 8 samples out of 28 collected over the past five years were over the criteria
- ▶ The 8 samples were in the range of 2 to 5 times higher than the criteria
- ▶ The median concentration is 25% higher in the most recent five years than in the prior five year period, showing a possible upward trend
- ▶ This waterbody exhibits the third highest median concentration of the parameter in the central watershed over the past five years

Next, **describe the water quality issue** by explaining why a water quality issue exists and the relative importance of that issue (e.g., how it reduces the use of the water body for its intended uses). The three paragraphs below are provided as examples of how this could be accomplished. The fourth paragraph provides an example of how to answer the question, “**what could be/should be done about it?**”.

The possible **sources** of pollution in the watershed include:

- ▶ rapid urban development bringing additional land application of fertilizers, pesticides, pet waste, septic systems, and new sewage outfalls, which can result in increased concentrations of nutrients, bacteria, and organic constituents in the water body
- ▶ a large area of cropland involving tillage, the use of fertilizers and pesticides, which can result in increased sediment loads to the water body, as well as nutrients and organic constituents from the fertilizers and pesticides
- ▶ wildlife waste which can add bacteria and nutrients

Note: A set of base maps showing the relationship of watershed characteristics with water quality conditions will be included in each *Watershed Summary*. The maps need to be at a suitable scale and contain an appropriate amount of detail, such as: water bodies with labels, major roads with labels, sampling sites with labels, counties and cities, segment boundaries, locations of water quality issues and factors influencing water quality.

The possible **reasons** for the water quality issue include:

- ▶ low flows, combined with pollution sources, do not provide adequate assimilative capacity
- ▶ a review of the flows related to the 8 elevated samples shows a direct correlation to rainfall and run-off, indicating that nonpoint sources are more likely to cause concentrations to exceed criteria, although base-level concentrations are somewhat elevated pointing to some influence from wastewater outfalls



- ▶ a review of the water quality upstream and downstream of the site show a decline from upstream to downstream possibly due to increased spring flows and distance from the rapid urban development in the upper portion of the watershed

The possible **effects** of the water quality issue include:

- ▶ the increased sedimentation can reduce the survivability of aquatic life and reduces the aesthetic use of the stream
- ▶ when flows increase after a rain event, the stream may not be suitable for swimming because bacteria concentrations increase by up to five times the state-established criteria
- ▶ nitrate concentrations at levels above 10 mg/L are considered too high for drinking water use, and levels above 30 mg/L are shown to have a negative impact on aquatic life in the stream
- ▶ the EPA has stated that perchlorate can cause developmental problems in children if consumed in drinking water

The best options for **addressing** this water quality issue include:

- ▶ continue the Planning Agency's supporting/technical role in the ongoing Watershed Protection Plan
- ▶ enhance stormwater controls for rock quarry operations
- ▶ work with local farmers to find an alternative to the use of atrazine
- ▶ obtain support for the regional wastewater treatment plan from local municipalities, developers, and county government
- ▶ conduct a special study to include two biological surveys including 24 hour dissolved oxygen measurements, target monitoring to run-off events as well as non-run-off events, and monitor monthly for two years at five sites in the watershed at locations near potential sources.

See Exhibit 5D for specific steps for conducting the Data and Trend Analysis

Evaluation of Biological and Toxics (Organics, Metals) Data

The information developed from biological surveys should be incorporated into the *Water Quality Review* to complement the findings from the water quality data. A comparison of the latest results to any previous results should be included to provide a long-term view of the information.

For toxics data compare the results to water quality standards, maximum contaminant levels, and/or screening levels and describe the relevance of the findings.

4.0 RECOMMENDATIONS AND CONCLUSIONS

4.1 Recommendations and Comments

While watershed-specific recommendations are made in the Watershed Summaries (see Exhibit 5E), this section needs to include recommendations and comments made by stakeholders who reviewed the draft Basin Summary Report. In addition, an outline of the programmatic, regulatory, and legislative recommendations to protect and improve water quality throughout the basin need to be discussed. These recommendations may include a consideration of resources available for implementing the action.

The results of the analyses for this report, as well as input from stakeholders, should be used to set some preliminary priorities for addressing water quality issues. These priorities will help define



where additional analysis may be needed for the Basin Summary Report. This will also help determine where additional information could be collected under the next biennium's Work Plan.

4.2 Conclusions

The report concludes with a discussion of how the Planning Agency's efforts have advanced the understanding of water quality. Also, this section will describe the Planning Agency's long-term vision of how basin efforts need to be directed during the next biennium to improve water quality.



Exhibit 5D
Data Analysis Steps
(for the Basin Summary Report Section 3.3)

Data Analysis Steps

1. Divide the basin into manageable sections (watersheds), considering segment boundaries.
2. Map each section/watershed. Show stations, segments, streams, cities, counties, major roads, outfalls, land use (e.g., major industrial sites, CAFOs, military installations), and label everything.
3. Discuss each section of the watershed in terms of land use and stream flow and how they may be influencing water quality (e.g., potential pollutants related to each land use).
4. Provide a summary of the monitoring to include the sampling sites used in the report with information on the date range of monitoring data at those sites, overall frequency of sampling, as well as the type of sampling (conventionals, field, etc.) that has been done at those sites.
5. Review the data and describe the water quality conditions by site/watershed.
 - a. Be sure to graph the data, whether it has an *Issue* or not, so that you can explain the water quality in the narrative. (See the *Tips for Organizing the Data Analysis* on the following page.)
 - b. Include graphs in the report for water quality issues that will benefit from a visual representation (especially for *Impairments*, *Concerns*, major exceedances, and other significant issues).
 - c. In the narrative, describe the water quality you see on the graphs (whether you include the graphs in the report or not).
 - (1) Describe the range (variability).
 - (2) Explain any measurements that do not meet criteria/screening levels.
 - (3) Does water quality vary with flow?
 - (4) Is there a seasonal component?
 - (5) What percent of the data exceeds the screening level for the past 7 years? Is it a *Concern* or an *Impairment*?
 - (6) Is a change in data over time visible? If there is enough data (>9 years, >19 records, continuous sampling), run a regression against time and describe the results (trend is significant with $t\text{-stat} = \text{or} > |2|$, $p\text{-value} < 0.1$).
 - (7) Is there any corollary information to explain the effect of the issue (e.g., how do other related parameters vary)?
 - d. Explain why the issues exist.
 - e. What are the possible effects of the issue?
6. Create a *Water Quality Issues Summary* table for each watershed (see example table on the following pages). Include the water quality issues that are either *Impairments*, *Concerns*, stakeholder concerns, significant excursions, and/or trends, and provide information in the columns to answer the 4 questions posed in the Guidance.
 - a. After the table, summarize and reference any special studies or work that has gone on in the watershed to improve water quality.
7. Provide an overall description of water quality for the watershed and recommendations in the *Water Quality Overview and CRP Recommendations* section (see exempling following the *Water Quality Issues Summary* table).
 - a. Describe the overall water quality conditions for the watershed and those areas of highest priority.
 - b. Describe additional information needed and how that may be collected.
 - (1) Sampling plan
 - (2) Land use information
 - (3) Land type (e.g., geology of the soils, aquifer, vegetation)

Tips for Organizing the Data Analysis

1. Pull all data for sites in the basin that provide a good representation of a water body. In some cases, more than one site will be needed to adequately represent a water body. Associate flow with every record, and in reservoirs, get information on releases and/or inflow if available.
 - a. Put the data for each watershed into a spreadsheet (Station, Date, Time, Depth, Parameter code, GTLT, and value) for all data. Select stations based on longevity, significance, and coverage. (If there are stations that are very close to each other, then you may want to select one over the other. If there are significant differences in the data, or known influences between the two sites, it may be necessary to keep both.)
 - c. In some cases, one station was dropped and a different one was picked up nearby, you will need to add those data sets together to achieve a longer data set; however, do not overlap data for the same period of record, since we do not want to double count data that may skew the results (e.g., data on the same day, data during the same month, more data in one month/quarter/year than in others).
2. Prepare the data for graphing and analysis.
 - a. Sort the data by Parameter code, station, and date.
 - b. Check for data that may need to be combined (e.g., put on the same graph) to lengthen the period of record (be careful not to double-up within a time period). For instance, nitrates have three or four different, yet comparable Parameter codes (00593, 00620, 00621, 00630, 00631), orthophosphate phosphorus has two (00671 and 70507), E. coli has at least two (31648, 31699), and chlorophyll a has two (32211, 70953). You might consider plotting fecal coliform values and E. coli values on the same graph to see if a trend is evident in both (but be sure to show them with different symbols).
 - c. Consider converting spec. conductance to TDS (let the reader know you have done this).
 - d. Non-detects can generally be left as is, ignoring the less than sign; however, in cases where a trend is visible, edit the non-detects to make them consistent. This can be done by changing all the non-detect measurements to the lowest non-detect measurement.
 - e. In most cases, it will be necessary to transform the bacteria data by taking the log of that data prior to performing any type of regression analysis.
3. Graph the data for each significant Parameter over time (nitrate, phosphorus, DO, pH, bacteria, TDS, TSS, ammonia, chlorophyll a)
 - a. Use a graph template and plot flow with the parameter whenever possible.
 - b. Check the scale to see if it needs to be adjusted. There may be a few high values that cause all the low values to be unrecognizable. Use some judgment as to where you should draw the line, but be as consistent as possible for each parameter.
 - c. If there are a few values that occurred years ago, exclude these from the graph.
 - d. If the data set is very long, and the earlier years do not show anything significant, consider plotting only the last 15-20 years of the data set. Be consistent on period of time.
 - e. If there is a value that appears to be unreasonable (almost impossible), it may be an outlier and should be excluded from the data review.
 - f. Be sure to plot the criteria or screening level on the graphs.



Exhibit 5E
Example Watershed Summary
(Example for the Basin Summary Report Section 3.3)

Plum Creek Watershed Characteristics

Plum Creek flows 52 stream miles from just upstream of Kyle to its confluence with the San Marcos River, just downstream of Luling. Stream flow in the upper portion is dominated by wastewater effluent, and up until 10 years ago, this portion of the stream was considered naturally intermittent. Stream flow in this portion of the watershed averages 2.5 cfs, with a range of between 0.2 and 90 cfs (based on 5 years of data). A USGS flow gage at US Hwy 183, just upstream of Lockhart, shows a typical (median) daily stream flow of 0.85 cfs, with a range of between 0.0 and over 5000 cfs (based on 50 years of data). This flow often stops for a few weeks during the summer months and it is suspected that the flow goes underground. In the central portion of the watershed, in Lockhart, springs begin to crop up along the Carrizo-Wilcox formation increasing the natural base flow of the stream. Stream flow picks up again below Lockhart with more tributaries and added wastewater effluent. Stream flow records at the USGS gage in the lower portion of the watershed, near Luling, show that the flow is typically around 13 cfs, ranging from below 1 to above 10000 cfs (based on 50 years of data). The **upper portion** of this watershed, from the confluence of Brushy Creek to the top of the watershed near Kyle, is dominated by limestone-type soils with the primary land use of range land and rapidly growing urban development. There are over 40,000 people living in this watershed's headwaters enhancing the likelihood for run-off from impervious cover, which can cause increased loading of pollutants in the stream, such as: bacteria, nutrients, sediment, herbicides used on lawns, and automotive products. Municipal wastewater facilities in this area are permitted for a maximum of 5 millions gallons a day.

The **central portion** of the watershed includes the town of Lockhart (5000 pop.), and is dominated by row-crop agriculture in the black waxy chocolate and grey loam soils of the Blackland Prairie. The springs in the area contain high concentrations of nitrate which correlate to the geology of the aquifer bearing formation. The row-crop agriculture can increase loading of pollutants in the stream, such as nutrients, sediment, and pesticides. Municipal wastewater facilities in this area are permitted for a maximum of 2 millions gallons a day.

The **lower portion** of the watershed includes the town of Luling (2500 pop.), and is dominated by more sandy soil with range land and oil field operations as the primary land use types. Several tributaries provide additional flow to this portion of the stream including Clear Fork and West Fork Plum Creek, which drain some row-crop agriculture areas, and a great deal of range land. The potential pollutants in this portion of the creek include: oil field products, nutrients, and bacteria. Municipal wastewater facilities in this area are permitted for a maximum of 1.7 millions gallons a day.



Plum Creek looking upstream of US Hwy 183 near Lockhart

Monitoring on Plum Creek

Site	Date Range	Frequency	Parameter Groups (Described in Sec.3.1)
GBRA Site 17406 at Plum Creek Road near Uhland	2001-present	Monthly	Conventional, Field, Bacteria, <i>Biology</i>
TCEQ Site 12647 at CR 202 near Lockhart	1998-present	Quarterly	Conventional, Field, Bacteria, <i>Biology</i>
GBRA Site 12640 at CR234 near Luling	1980-present	Monthly	Conventional, Field, Bacteria, <i>Metals, Organics</i>

* Items in italics are sampled less frequently.

Water Quality Data Review

In the following section, the water quality data is reviewed over time for selected sites, and a short discussion of the water quality for each parameter is provided. Each parameter's narrative will provide information on the status of water quality and reasons why water quality may not always meet the State Water Quality Standards and Criteria. The water quality concerns identified in this section will be summarized in the **Water Quality Issues Summary**, a table at the end of the data review section. This table will provide information on the potential effects of the water quality issues and what could be, or has been, done to address the issue.

The graphs that are included in this section are provided when they portray a specific situation, such as an *Impairment*, *Concern*, trend, or significantly elevated values. The graphs provide data over the life of a site (or sites) with flow (where available) and the State Water Quality Criteria (shown as a line across the graph).

Graphs for data not presented in this section of the report are available in the Appendix.

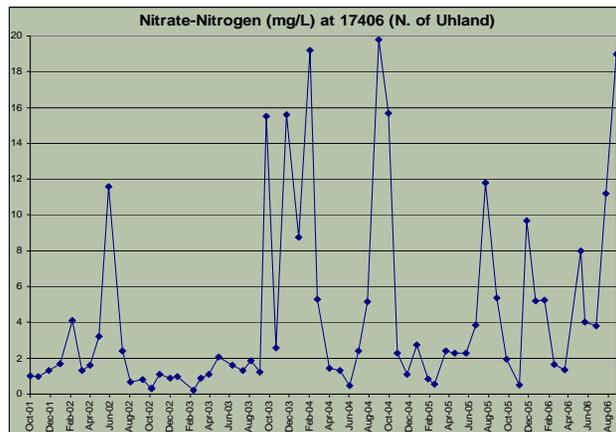
Upper Portion of the Watershed, GBRA Site 17406 at Plum Creek Road just north of Uhland

Total Dissolved Solids (TDS) range between 260-845 ppm, well below the criteria of 1120 ppm. There is a noticeable upward tendency over time; however, a longer period of record is needed to verify if a trend exists. The most recent year of data, 2006, was a particularly dry year and could be causing a temporary elevation in TDS. The elevated values may be related to the ground water used as drinking water that ultimately becomes wastewater effluent.

Dissolved Oxygen (DO) shows a noticeable annual variation with high values in the winter (~13 mg/L) and low values during the summer months (~4 mg/L), when the water heats up and cannot hold as much oxygen. There is a noticeable downward tendency over time for the summer months. There may be an increase in DO during the spring months when algae is growing rapidly, so a stronger diurnal variation may be occurring at this time. A longer period of record is needed to verify if a trend exists. The most recent year of data, 2006, was a particularly dry year and could be causing a temporary reduction in DO.

pH values from late 2001 to mid-2004 showed a relatively large variation between 7.6 and 8.2; however, since mid-2004 the range of variation has become smaller with lows around 7.7 and highs around 7.9. Something to keep an eye on is the last year (2006) which shows a significant reduction in pH with values down to 7.4. This is not a concern, just a change in water quality that needs to be watched and better understood.

Nitrate-Nitrogen over the past five years exceeded the Screening Level over 44% of the time. There are over 20 spikes that vary between 4 and 20 mg/L. These spikes appear to be correlated to times when flows are low and the stream becomes highly effluent dominated.

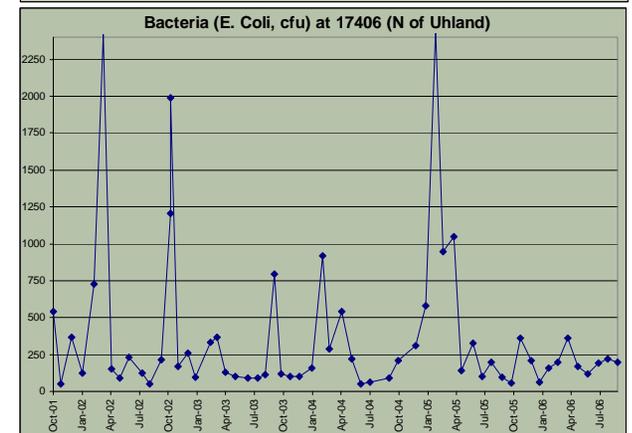
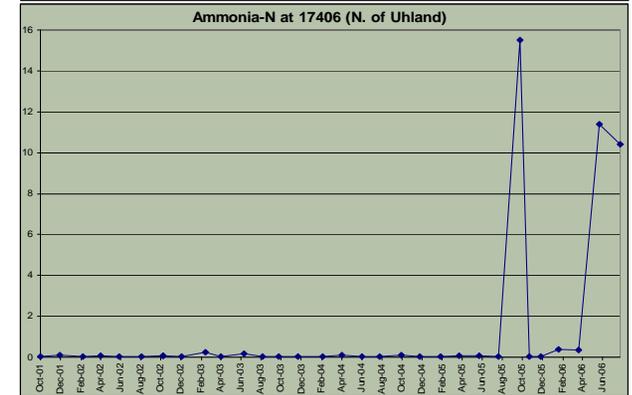
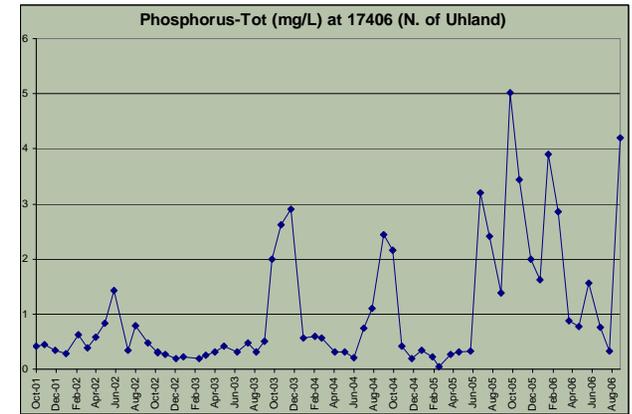


Total Phosphorus (TP) exceeded the screening level 23 out of 71 times in the past five years, with some spikes from 3-5 mg/L. The majority occurred between July 2005 and September 2006, which was a very dry period. The spikes appear to be correlated to times when flows are low and the stream becomes highly effluent dominated. Over 38% of the samples exceed the Screening Level.

Ammonia-Nitrogen typically remains low, around 0.05 mg/L, but three spikes occurred between October, 2005 and August, 2006. This is a significant threat to aquatic life in the stream. Additional data collection is needed to see if exceedances continue, or if this was a temporary problem. This did not appear on the 305(b) list since it occurred after the period of record used for that assessment.

Bacteria (E. coli) tends to fall in the range of 70 to 300 mpn, but there are at least 12 spikes that range from 500 to more than 2000 mpn. The elevated values are only somewhat related to high-flow/run-off events, because some elevated values do not appear to be related to increases in flow; however, the period of very low flows from June 2005 to August 2006 shows no spikes in E. coli. The concentration of E. coli during this same period does show 12 out of 16 values above the 126 mpn geometric mean.

This points to a background concentration of E. coli that is relatively high. The geometric mean for this data set is 205 mpn making it an *Impairment*.



Chlorophyll a tends to fall in the range of 3 to 7 ug/L. There have been some spikes in algae prior to 2005, but concentrations have leveled off and a positive tendency to lower concentrations may be occurring. Additional years of data are needed to verify this, especially since detection levels have changed in the past few years and this may be causing a false trend.

Biology of fish and aquatic insects shows limited aquatic life use for both fish and aquatic insects. The habitat review indicated that surrounding land use was acceptable for maintaining an adequate riparian area around the stream.

Central Portion of the Watershed, TCEQ Site 12647 at CR 202 Southeast of Lockhart

Total Dissolved Solids (TDS) tends to fall in the range of 500-650 mg/L, which is well below the criteria of 1120 mg/L. There have been 7 of the 21 samples with values lower than 400, during 2001. Flow records for this period do not appear to correlate well with the change in TDS during 2001.

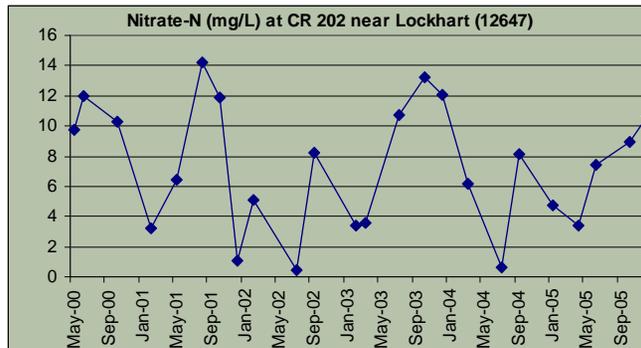
Dissolved Oxygen (DO) over time shows a range of between 5.7 and 10 mg/L with a relatively evident natural annual variation between summer and winter months, since warmer water cannot hold as much oxygen. There is no concern or discernable change in DO over time at this location.

pH levels typically vary between 7.6 and 8, with a couple lower samples in 2001. There is no concern or discernable change in pH over time.

Ammonia-Nitrogen concentrations typically vary between 0.05 and 0.06 mg/L with one jump to 0.1 mg/L in early 2003.

Nitrate-Nitrogen

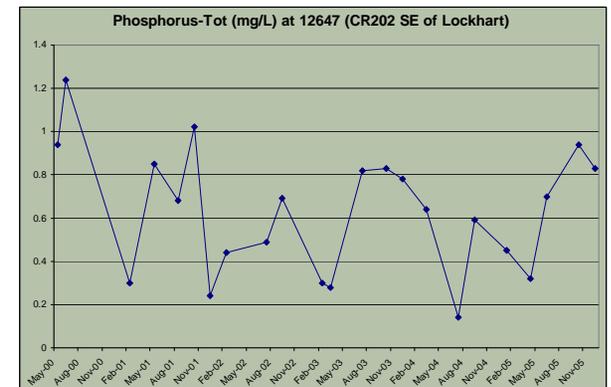
concentrations vary widely from 1 to 14 mg/L. Three of the most recent low values are correlated directly to high-flow events showing that a great deal of dilution occurs with run-off and wastewater effluent may be having an effect during low-flow, dry periods. In addition, the springs in and around Lockhart are naturally high in nitrates from the geology of the aquifer. Twenty-one of the 26 samples (2000-2005) exceed the Screening Level making this a *Concern*.



Total Phosphorus (TP) typically varies from 0.2 to 1 mg/L, with 43% exceeding the Screening Level of 0.69 mg/L, making it a *Concern*. The concentrations at this location do not show the spikes of the upstream site.

Total Suspended Solids (TSS) varies a great deal between 8 and 80 NTUs. A review of the data against flow did not show a consistent relationship with flow; therefore, suspended solids in the stream may be related to factors other than run-off, such as stream substrate, wastewater outfalls, animals in the stream, construction activities, and other land use that disturbs soils.

The low values appear to be correlated with higher stream flow indicating a dilution effect with run-off and wastewater effluent dominating during lower flow periods. OrthoPhosphate Phosphorus (OP) appears to mimic these values, but the Screening Level is even lower for OP, at 0.37 mg/L, causing 71% of those values to exceed the Screening Level, making it a *Concern* as well.



Bacteria (E. coli) typically ranges between 100 and 200 mpn, which indicates a constant background concentration. The geometric mean of the data is 118 mpn, which just falls below the 126 mpn criteria. There are two samples out of the 16 available that are in the 400s and 500s, but no values as high as those found in the upper watershed. The three highest values are directly correlated to higher stream flow and run-off, so there are both point and nonpoint sources influencing bacteria concentrations.

Chlorophyll a concentrations are at the detection level of 5 ug/L most of the time, with three elevated values in Feb. 2002, Jul. 2002, and Feb. 2003. All three of these values occurred during high flow, run-off events which is unusual since those events tend to push those constituents downstream.

Biology shows that the fish community, habitat, and aquatic insects are appropriate for the stream type.

Total Suspended Solids (TSS) varies a great deal between 5 and over 100 NTUs. A review of TSS and flow shows that there are some events with high TSS and low flow, as well as some events with high TSS and high flow. This indicates that both run-off and background conditions can increase TSS.

Lower Portion of the Watershed, GBRA Site 12640 at CR 135 Southeast of Luling

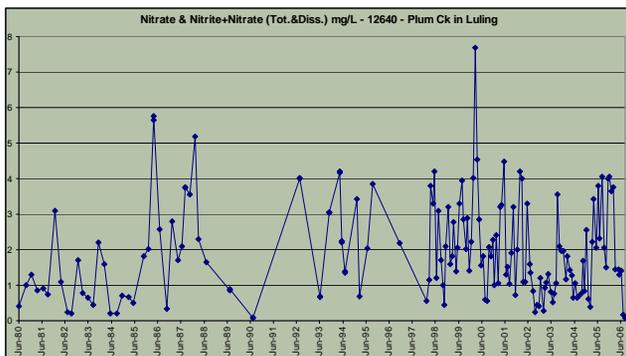
Total Dissolved Solids (TDS) tends to fall in the range of 325-1105 mg/L, below the average criteria of 1120 mg/L. There is a great deal of variability in TDS over time. A comparison of conductivity to flow was conducted and it showed a very strong correlation; as flows increase, conductivity decreases. This indicates that a background concentration exists which could be related to flows of springs in the area and the Salt Branch of Plum Creek which has naturally high levels of salts.

Dissolved Oxygen (DO) varies between 4 and 11 mg/L and has a well-defined seasonal variation with low values in the summer months when elevated temperatures reduce the ability of the water to hold oxygen. The low flow periods of 1998, 2000, and 2006 correlate with low concentrations of DO.

pH varies from 7.5 to 8.1. There does not appear to be any seasonal variation or change over time.

Ammonia varies between the detection level of 0.02 to 0.08 mg/L since 2001 when it was determined that the laboratory analysis for ammonia in freshwater streams should not use the distillation step needed for wastewater analysis. The laboratory analysis is now much more accurate. A review of the data over time does not show any discernable trend, in light of the change due to laboratory analysis.

Nitrate-Nitrogen typically varies between 0.2 and 4 mg/L. There are 20 of 61 samples from 2000 - 2006 that exceed the Screening Level making this a *Concern*. The nitrate concentration at this location is typically half to one-quarter that of the next upstream site which is located southeast of Lockhart. The high values seen at the most upstream site are sometimes double those of the Lockhart site. This is possibly due to an increased assimilative capacity of the stream as it gets more flow in the most downstream portion of the watershed. There is no discernable change in water quality over time.



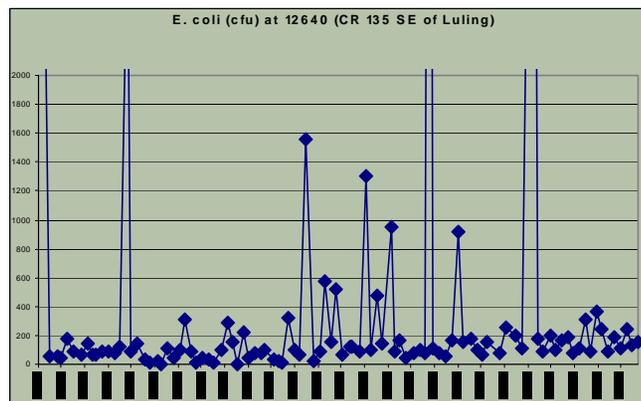
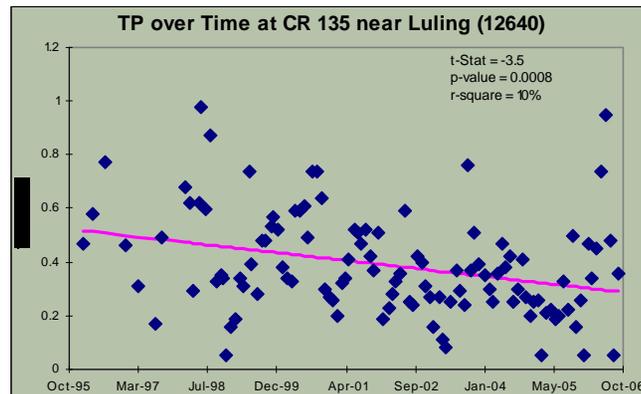
Total Phosphorus (TP) typically varies between the detection limit 0.05 and 1 mg/L. This is similar to the upstream site southeast of Lockhart. Only 5 of 81 samples from 2000-2006 exceed the Screening Level, so it is not considered a *Concern* at this location. It appears that there may be a slight downward trend to the data indicating an improvement in water quality. A regression of TP over time for the past 10 years indicates a significant downward trend. It is not clear

why this trend is occurring. The two high values in 2006 were likely caused by very low flows during a dry year, when effluent was the only flow in the stream.

Bacteria (E. coli) typically varies between 10 and 300

mpn with a number of elevated values above 400 mpn. The geometric mean of the values from 2000-2006 is 134 mpn which is greater than the Standard Criteria, making this a possible *Impairment*. The consistently elevated concentrations (>80 mpn) point to a continuous source, such as an outfall, septic leakage, and/or wildlife in the stream. There is some indication from the graph that E. coli is increasing over time, but a regression was run that did not show a significant change over time. Several of the very high values are related to high-flow, run-off events.

Chlorophyll a (algae) typically varies between the detection level, which has changed several times over the history of data collection at this site (from 1 to 4), to around 10 ug/L, with several samples in the teens, twenties, and thirties. The last four elevated values correlate to high-flow run-off events. This may be related to a high loading of nutrients during run-off events that feeds the algae. From 2000 through 2006, there have only been 4 out of 57 samples that exceeded the Screening Level, meaning this water body is not a *Concern* for Chlorophyll a. The data from 2004 through 2006 only once exceeded 5 ug/L. There were at least three very high flow events during this time, that did not result in high concentrations of chlorophyll a. It is unknown why the relationship does not always hold true. It doesn't appear to be the time of year, since the elevated values were found at all times of the year.



Metals - It is often very difficult to detect metals in water since they are often hydrophobic, meaning they do not stay dissolved in water, but instead cling to sediment and other particles in the water. Samples were collected in August 1997 to determine if any metals existed in the water and no detections were found.

Total Suspended Solids (TSS) varies widely between 5 and 250 NTU. A review of the data over time does not show a change in water quality. A regression of flow and TSS was conducted that showed a strong correlation indicating that run-off events cause increased sediment in the stream.

Water Quality Issues Summary

Water Quality Issue	Affected Area	Possible Influences / Concerns Voiced by Stakeholders	Possible Effects	Possible Solutions / Actions Taken
Impairment for E. coli bacteria on 2006 Water Quality Inventory	Upper and lower portion of the watershed	<ul style="list-style-type: none"> ▪ Rapid urbanization, impervious cover ▪ Construction stormwater controls failing ▪ Developments with septic tanks or small, privately-run wastewater treatment plants ▪ Small, slow moving stream with little assimilative capacity ▪ Illegal dumping at creek crossings 	<ul style="list-style-type: none"> ▪ Increased quantity of stormwater scouring stream beds, creating additional sediment loading and urban-related pollutants ▪ Bacteria load from land use and effluent is not reduced by instream flow ▪ Significant contact recreation (e.g., swimming) could lead to gastrointestinal illnesses 	<ul style="list-style-type: none"> ▪ Improve stormwater controls in new developments ▪ Adequate construction oversight ▪ Wastewater regionalization to prevent multiple small package plants and reduce septic tanks ▪ See <i>Response to Concerns</i>
Elevated Ammonia-Nitrogen	Upper portion of the watershed	Wastewater treatment plants	Detrimental effect on aquatic biological community	Wastewater treatment plant improve operations
Concern for Nutrient Enrichment (Nitrates and Phosphorus)	Entire watershed	<ul style="list-style-type: none"> ▪ Wastewater treatment plant effluent ▪ Spring water high in nitrates from geology of aquifer formation ▪ Row-crop agriculture 	<ul style="list-style-type: none"> ▪ Can increase production of algae causing an aesthetic nuisance ▪ Can cause significant swings in dissolved oxygen, affecting viability of aquatic life ▪ In moderate amounts, can actually enhance the fish population 	<ul style="list-style-type: none"> ▪ If dissolved oxygen swings are significant and biology shows a related effect, then some phosphorus controls may be needed for wastewater treatment plants ▪ Water golf courses and other open areas with effluent- may actually reduce water quality due to reduced flows in the stream
Stakeholder concern for oil and gas operations	Lower portion of the watershed	<ul style="list-style-type: none"> ▪ Recent increased oil and gas activity ▪ Historical stakeholder accounts indicate sheens in 70s and 80s, but not today 	<ul style="list-style-type: none"> ▪ Detrimental effect on biological community ▪ Drinking water polluted with organic oil field by-products ▪ Contact recreation use could lead to illnesses 	RA sampled two sites, twice, and found no detection of related pollutants
Decreasing Trend for Total Phosphorus	Lower portion of the watershed	<ul style="list-style-type: none"> ▪ Reduction in wastewater treatment plant effluent ▪ Unknown* 	<ul style="list-style-type: none"> ▪ Reduction in algae production in the stream ▪ Reduction in diurnal swings in dissolved oxygen, reducing stress on aquatic biology 	Re-use of wastewater treatment plant effluent during dry, low-flow periods

* If unknown, then either try to find out, or find out over the next 2-3 years and include in the next applicable Basin Highlights Report and/or next Basin Summary Report.

Response to Concerns

The RA has responded to stakeholder concerns relating to the rapid urbanization in the upper portion of the watershed by adding a new, long-term monthly monitoring site in the upper portion of the watershed. This new monitoring site is important to better understand the differences and unique attributes of each portion of the watershed and to get information on a part of the watershed where there was none before. In addition, the RA has added two biological monitoring events to this watershed to get a better understanding of whether the water quality concerns are having a detrimental impact on the biological community. The RA advocated for a Watershed Protection Plan for the watershed so that all concerns could be holistically addressed and implementation strategies could be vetted among stakeholders to ensure a positive future for water quality in the watershed.

Special Project

The Texas State Soil and Water Conservation Board (TSSWCB) has selected the watershed for the development of a Watershed Protection Plan (WPP). A WPP is a stakeholder-driven, proactive, voluntary strategy for protecting and improving water quality that identifies appropriate best management practices, needed education and awareness programs, and other measures necessary to ensure the long-term health of the watershed. TSSWCB has partnered with Texas Cooperative Extension to facilitate development and implementation of a WPP through a Watershed Partnership, a collaboration between local citizens and regional entities, including the RA, County, City, Housing Development, Soil and Water Conservation Districts, and County Soil and Water Conservation District. Local stakeholders are vital to the success of the WPP and to protecting the region's water resources now and into the future. For more information, please visit: www.abcWPP.com.

Watershed Overview and CRP Recommendations

The water quality in this Creek is affected by wastewater effluent during low flow periods and by urban, agricultural, and wildlife sources in rainfall run-off, causing concentrations of bacteria and nutrients to be elevated a significant portion of the time. This could reduce the use of the water for contact recreation (swimming), and could reduce the aquatic life in the stream. The very top of the watershed is under a great deal of stress from rapid urban growth, and because there is very little natural stream flow in this area, the water quality is highly affected by human activity. Water quality monitoring needs to continue on a frequent (monthly) basis, with biological sampling each year. The parameters to watch closely are ammonia-nitrogen, nitrate-nitrogen, phosphorus, biology, total suspended solids, and bacteria. A question remains regarding total phosphorus and why it shows improvement in the lower portion of the watershed.

The RA will continue to actively support the Watershed Protection Plan for the Creek through targeted monitoring and public outreach/education efforts.



TASK 6: STAKEHOLDER PARTICIPATION & PUBLIC OUTREACH

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TASK 6: STAKEHOLDER PARTICIPATION & PUBLIC OUTREACH

Introduction

A comprehensive watershed assessment program should encourage the participation of stakeholders in developing water quality objectives and priorities for the basin. A stakeholder is defined as any individual or entity that has a vested interest in the basin's waters, and includes the general public, institutions, government, industry, fee payers, and other interested parties. The Clean Rivers Program provides the opportunity for direct public participation to ensure that local water quality concerns are addressed.

Building a strong stakeholder group and maintaining an active participation level is accomplished through the Steering Committee process as well as other public outreach activities, including educational presentations and workshops, volunteer monitoring programs, additional public meetings, web site updates, news releases, public service announcements, advertisements, and the distribution of fact sheets, newsletters, book covers or videos to the general public.

Stakeholder involvement, public outreach and other CRP goals and objectives are outlined in the CRP Long-Term Plan, at <http://www.tceq.state.tx.us/assets/public/compliance/monops/crp/CRP-LongTermPlan06.pdf>.

Stakeholder Participation

In each stage of planning, development and implementation of watershed activities, it is important to get support from relevant stakeholders: those who help make decisions, and those who will be affected by them. Stakeholder knowledge of local conditions often provides the reality check for scientific efforts and helps to define what is actually desirable and achievable. It is also important to make sure that the contributions of stakeholders are both recognized and used in some manner to reach the goals of the CRP.

Basin Steering Committee

A Steering Committee is an essential component of the public participation process that provides for meaningful input by citizens and organizations that reside in or near the watershed. As one of the most important elements of the CRP, the active participation of a strong Steering Committee is also one of the best opportunities for expanding stakeholder participation. Planning Agencies have the responsibility to organize and lead a basin-wide Steering Committee that serves as the focus of public input and assists with the:

- Creation of specific, achievable water quality objectives and basin priorities,
- Review and development of work plans and allocation of resources,
- Review, development and approval of major reports,
- Establishment of monitoring priorities and development of monitoring plans,
- Identification of priority problem areas and possible actions to address these problems and pollutant sources.



Membership Guidelines

It is a primary responsibility of each Planning Agency to establish and maintain a diverse and representative basin-wide Steering Committee. To ensure that the different interests, concerns and priorities of each watershed are addressed, TAC rules specify that the Steering Committee will include stakeholder volunteers from across the basin, representing:

- citizens
- fee-payers [identified in Texas Water Code TWC 26.0135(h)]
- political subdivisions (including local, regional, and state officials)
- appropriate state agencies including:
 - Texas Commission on Environmental Quality regional staff
 - Texas Parks and Wildlife Department
 - Texas Water Development Board
 - Texas State Soil and Water Conservation Board
 - Texas General Land Office
 - Texas Department of State Health Services
 - Texas Department of Agriculture
 - Texas Railroad Commission
 - Texas Department of Transportation
- other entities interested in water quality matters including:
 - environmental and public interest groups
 - agriculture
 - business and industry.

Steering Committees should consist of stakeholders who are committed to identifying water quality issues in the basin, prioritizing resources and monitoring plans, and providing input on reports. Because the general public is often the least well represented stakeholder group, special emphasis should be placed on engaging and recruiting citizens to serve and attend meetings.

To maximize the potential for increasing participation, Planning Agencies should take every opportunity to promote the CRP and the role of the Steering Committee. This includes using applicable CRP meetings, letters, the CRP promotional video, e-mails, web sites and questionnaires to introduce potential members to the CRP and promote participation in the Steering Committee.

Steering Committee volunteers must regularly be reviewed against the CRP guidelines to determine if reasonable representation is being maintained. If listed groups are not represented, efforts should be made to recruit replacements before the next Steering Committee meeting. A list of all Steering Committee members and their affiliations will be maintained by the Planning Agency and submitted to the CRP Project Manager upon request. *To reduce duplication of efforts, membership confirmation can be combined with the notification of the upcoming Steering Committee Meeting. Planning Agencies should contact all Steering Committee members with a questionnaire or survey to confirm their continued participation, provide a list of the upcoming meeting agenda topics, and request additional topics and potential stakeholders.* See Exhibit 6A for a sample stakeholder questionnaire and meeting announcement.

Communication

In addition to confirming ongoing participation in the Steering Committee, it is recommended that an additional form of regular communication be established with Steering Committee members and other interested stakeholders in order to keep them informed of basin activities. The communication could be via e-mail or list server posting, phone calls, newsletters, or mailed letters. By encouraging frequent



feedback from recipients, this process will contribute to project planning and Steering Committee meeting agenda development. Priority items to be considered for inclusion in Steering Committee communication consist of:

- Proposed changes in basin priorities
- Work plan and resource allocation issues and development
- Basin water quality monitoring, assessment, coordination, and QA activities (including 305(b) Water Quality Inventory, Total Maximum Daily Load studies and Watershed Protection Plans)
- Relevant CRP administrative, funding and budget issues
- Announcements, upcoming events, and agendas for upcoming meetings

Meetings

Steering Committees will meet publicly and should play an active role in the development of meeting agendas and promotion of stakeholder involvement. To ensure program priorities are met and stakeholder issues are addressed, Planning Agencies should incorporate the following guidance into their Steering Committee meeting planning process.

Scheduling

Each fiscal year, it is required that Planning Agencies conduct at least one Steering Committee meeting to address basin-wide water quality issues. Due to the size and diversity of individual basins, it may be difficult for a single annual meeting to fully accomplish all meeting requirements. All attempts should be made to schedule convenient dates and times for meetings, and allow time for stakeholders traveling from other parts of the basin.

In order to allow the Steering Committee to provide input towards water quality priorities, allocation of resources, monitoring coordination and required annual reports, it is recommended that at least one meeting be scheduled after the draft *Basin Highlights (or Summary) Report* is completed, and prior to the annual Coordinated Monitoring Meeting. It is important that Planning Agencies negotiate mutually agreeable Steering Committee meeting dates with their TCEQ Project Manager before stakeholders are notified of the meeting date.

Meeting Announcements

To provide adequate notice of upcoming Steering Committee meetings, it is recommended that Planning Agencies issue a *"save the date" notification a minimum of 45 days in advance* of the next meeting. As discussed in the Membership Guidelines section, Planning Agencies should contact all Steering Committee members with a questionnaire or survey to confirm their continued participation, provide a list of the draft meeting agenda topics, and request additional topics and potential stakeholders. See Exhibit 6A for a sample questionnaire. A final meeting announcement with the proposed agenda should be distributed *a minimum of 15 days in advance* of the meeting by use of written or electronic invitations, the Planning Agency's web site, public postings or press releases provided to local newspapers.

Agenda Topics

Priority items that require assistance of the Steering Committee for development and review include:

- **Water Quality Objectives and Priorities** - Development of monitoring priorities
- **Basin Summary/Highlights Report** - Review, suggestions for modification, and approval of the draft Basin Summary/Highlights Report prior to publication
- **Work Plans and Allocation of Resources** - Operation and effectiveness of the CRP work plan and the use, adequacy and allocation of the program's costs and funds
- **Public Participation** - Upcoming events, public outreach, and educational activities



Additional items that should to be addressed during Steering Committee meetings on an annual basis:

- Overview of the CRP (including its goals and how the program is funded)
- Recent Planning Agency accomplishments achieved with CRP support
- Identification, selection, and status of special study projects
- Recognition of efforts by Steering Committee, stakeholders, volunteers, and others

Along with the above topics, Steering Committee meetings will also provide the opportunity to discuss any topics that are of significant interest to stakeholders, including non-point source pollution issues, groundwater quality or availability, illegal dumping, basin-specific problems, agricultural issues and clean-up efforts. To provide additional viewpoints and expertise, Planning Agencies should seek out subject matter experts to present on applicable topics.

In order to meet these requirements, it is important that Planning Agencies provide Steering Committee members with all necessary meeting materials, including the agenda, draft reports, summaries, work plans, special studies, maps, monitoring schedules and other items to be discussed.

Meeting Evaluation and Feedback

It may be useful to distribute an evaluation at the end of the meeting to determine if stakeholders needs and concerns have been met. After each meeting, Planning Agencies have the responsibility to ensure that stakeholder input, comments and decisions are appropriately addressed, subcommittee meetings are scheduled if necessary, and meeting minutes are posted to the web site.

Subcommittee Workgroups

For certain activities designated as priorities by the Steering Committee, it may be beneficial and more efficient to create smaller subcommittee workgroups with the responsibility of a more focused look at special studies, project planning, development of monitoring priorities, and implementation activities. In establishing a subcommittee workgroup, the Steering Committee should attempt to bring together the most appropriate skills and resources available to advance projects.

Education & Outreach

Planning Agencies should work to increase public awareness and interest, and enhance public participation in setting and implementing basin priorities. Opportunities for participation in the CRP that support overall program goals include:

- presentations or booths at schools, public meetings and conferences
- distribution of applicable educational materials, curriculum, and CRP video
- development and/or distribution of fact sheets or newsletters
- news releases, public service announcements, and advertisements
- toll free hot lines, e-mail groups, up to date CRP web site, and email list servers
- participation in volunteer monitoring programs
- participation in the Texas Watershed Stewards program

With prior approval, funds may also be applied to outreach activities such as community action projects; including clean-up events, collection or disposal of hazardous household or agricultural products, watershed surveys, and storm drain stenciling.



EPA Outreach Documents

Informing stakeholders of the issues, educating them about what needs to be done, and motivating them to take action will help Partner Agencies meet both the legislative obligations of the CRP and other water quality objectives. To help Planning Agencies accomplish this, two EPA publications; *Getting in Step: A Guide for Conducting Watershed Outreach Campaigns*, and *Getting in Step: Engaging and Involving Stakeholders in Your Watershed*, are recommended as resources. The guides provide the tools needed to develop and implement an effective outreach campaign as part of a regional water quality improvement effort, and will help with understanding the audiences in your watershed, creating messages that resonate, and finding appropriate ways to communicate.

See Exhibits 6B and 6C for an overview of the two EPA outreach documents.

Volunteer Monitoring

Monitoring of local water bodies by citizen volunteers is an excellent way to meet many of the goals and responsibilities of the CRP. Volunteer monitoring activities can be used by Planning Agencies to:

- Educate citizens about water quality and watershed management issues
- Enhance public participation in setting and implementing basin priorities
- Collect water quality data for planning purposes

Planning Agencies can choose to implement a volunteer monitoring program based on their own pre-determined set of guidelines, or can choose to implement activities supported by the Texas Stream Team Volunteer Monitoring Program.

Texas Stream Team

The Texas Stream Team Volunteer Monitoring Program can serve as a resource for a variety of outreach and training materials. Through a partnership with TCEQ, USEPA, and Texas State University, the Texas Stream Team supports environmental education activities and volunteer monitoring data collection programs throughout the state. The program also provides assistance to participating partners and develops, promotes, and maintains environmental education activities. Additional information can be obtained by contacting the Texas Stream Team directly, or visiting <http://txstreamteam.rivers.txstate.edu>.

Planning Agencies that choose to implement volunteer monitoring should determine the appropriate methods and focus for these activities in their basins. As it relates to CRP, the collection of volunteer water quality data is considered to be an educational activity used to promote or enhance public awareness of water quality issues and involvement in CRP goals. To support this, the Texas Stream Team's QAPP limits the designated use for volunteer data to education and research, problem identification, local decision-making and planning purposes.

Planning Agency Web Site

Planning Agency web sites have been established to circulate information more effectively and to enhance the ability of the public to gain access to detailed information regarding CRP activities. The TCEQ considers this form of communication a very important tool for increasing stakeholder and public awareness and improving involvement in the CRP.



Requirements

During the upcoming biennium, Planning Agencies will continue to update and improve their CRP web sites. To meet CRP goals, it is required that Planning Agency web sites include the following items and information:

- **Explanation of CRP, the Planning Agency, program goals, and the planning process**, to include: basin specific priorities developed from stakeholder input, a description and promotion of the Steering Committee process, defined roles for stakeholders, Steering Committee meeting minutes, and information on how to get involved.
- **Upcoming events and project updates**, including: Steering Committee meeting announcements and agendas, updates on special studies or a summary of project activities, and notification of other applicable and upcoming public outreach events occurring in the basin.
- **Contact information for Planning Agency**, to include: e-mail addresses, telephone numbers, mailing address and physical address.
- **Links to outside resources**, including the TCEQ Clean Rivers Program, other CRP Partners, and the Texas Stream Team Volunteer Monitoring Program.

Deliverables to Post

The following is a summary of the required work plan deliverables for all Tasks in the FY2010-11 CRP Guidance that must be posted on the Planning Agency web site.

Project Administration

Final Work Plan

Project Planning and Quality Assurance

- Complete Quality Assurance Project Plan OR:
- Monitoring/Project Objectives (A6, B1)
- Measurement Performance Specifications (Table A7.1)
- Special Study Appendices

Water Quality Monitoring

- Special Study Reports
- Link to CRP Coordinated Monitoring Schedule (<http://cms.lcra.org>)

Data Management

Water Quality Monitoring Data or link to TCEQ Water Quality Data

Data Analysis and Reporting

- Basin Highlights Report (with archived reports for the last five years)
- Basin Summary Report (at a minimum: Executive Summary & maps)

Stakeholder Participation and Public Outreach

- Announcements and agendas of Steering Committee and CRP public meetings
- Steering Committee meeting minutes or summaries



Special Projects

- Special Studies and/or Project Reports

Updates

The web site will be reviewed on a quarterly basis to ensure that information and announcements remain current and relevant. *It is required that the Planning Agency also include summaries of revisions to the web site with the corresponding quarterly Progress Report.*

Deliverables required to be posted to the web site will follow the due dates indicated in the individual work plans. Posting dates for certain reports and project plans that are based on completion of the document or meeting should be negotiated with the CRP Project Manager.



Exhibit 6A

Stakeholder Questionnaire and Meeting Announcement



EXHIBIT 6A

Clean Rivers Program Stakeholder Questionnaire

In order to better serve our stakeholders, the River Authority would like to know about topics and other water issues relevant to our stakeholders that should be addressed in future Clean Rivers Program (CRP) meetings. The following are topics for discussion for our next stakeholder meeting, which will be held on May 1, 2008. Please rate them on a scale according to how important these issues are as they relate to inclusion in our next CRP meeting agenda. You will be contacted with further information regarding our next CRP Steering Committee Meeting. We appreciate your past participation and look forward to your continued participation.

1. Implementation of nutrient standards in TPDES permits

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |

2. Construction/Development Impacts to Water Quality

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |

3. Permitting Trends in Wastewater

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |

4. Proposed changes to water quality standards in the Basin

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |

5. Review what the CRP actually represents and how customers benefit

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |



6. Water Bodies Not Meeting State Water Quality Criteria

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |

7. Environmental Enforcement, Illegal Dumping and Illegal Discharge

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |

8. Watershed Protection Plans

- | | |
|---|---|
| <input type="checkbox"/> Very Important | <input type="checkbox"/> Not Very Important |
| <input type="checkbox"/> Somewhat Important | <input type="checkbox"/> Not at all important |
| <input type="checkbox"/> Don't Know | |

9. Are there any other water quality related issues in the Basin that you would like highlighted and/or discussed in more detail?

10. Are you still interested in receiving correspondence from the River Authority regarding CRP meetings and other stakeholder events?

11. Can you provide the names or organizations of potential stakeholders that may be interested in CRP activities?

Thank you for taking time to complete this survey!

To facilitate future communication please provide the following contact information:

- Name:
- Organization/Agency:
- Address:
- Phone #:
- E-mail address:

If you have questions or need additional information about this meeting please contact:



Exhibit 6B

***Getting In Step:* A Guide for Conducting Watershed Outreach Campaigns**



EXHIBIT 6B

Getting In Step: **A Guide for Conducting Watershed Outreach Campaigns**

This publication was prepared by Tetra Tech, Inc., under a contract with the U.S. Environmental Protection Agency (EPA). Complete copies of this and other EPA outreach materials can be obtained at: <http://www.epa.gov/owow/watershed/outreach/documents>.

The purpose of this guide is to provide the tools needed to develop and implement an effective outreach campaign as part of a state or local water quality improvement effort. Whether you're charged with developing a watershed management plan to restore impaired waters or protecting your local water resources for the future, this guide will help you understand the importance of reaching out to people and motivating them to act. It will help you understand the audiences in your watershed, create messages that resonate with them, and find appropriate ways to communicate your message.

The guide will also provide new information on how to incorporate social marketing techniques into your campaign to generate sustainable behavior changes that will protect water quality. The guide will teach you how to listen to the needs of your audience rather than just blindly handing out fact sheets or reports that sit on shelves and collect dust. It will show you the important roles that audience research and program evaluation play in changing personal behavior. The step-by-step approach in this guide will help you to determine the most effective vehicle to reach the target audience.

As a companion to the guide, EPA and the Utah Department of Agriculture and Food have jointly developed a how-to video called *Getting in Step: A Video Guide for Conducting Watershed Outreach Campaigns*. This 35-minute video provides background on the six steps for conducting an environmental outreach campaign and includes four in-depth case studies that showcase successful local outreach programs from across the country.



Exhibit 6C

***Getting in Step:* Engaging and Involving Stakeholders in Your Watershed**

EXHIBIT 6C

Getting in Step: **Engaging and Involving Stakeholders in Your Watershed**

This publication was prepared by Tetra Tech, Inc., under contract to the U.S. Environmental Protection Agency. Complete copies of this and other USEPA outreach materials can be obtained at: <http://www.epa.gov/owow/watershed/outreach/documents>.

Why involve stakeholders?

Whatever the reason for conducting watershed management activities, stakeholders can help. Inclusive processes increase awareness and understanding of issues and challenges, generate more data, help determine priorities, increase support for remediation programs, and generally enhance the likelihood of success. Stakeholder processes often provide the reality check for scientific efforts: they seek to synthesize ecological, technical, social, cultural, political, and economic concerns through a process that helps to define what's actually doable.

If you're responsible for developing and implementing a watershed management program, you need support from relevant stakeholders...those who will make decisions, those who will be affected by them, and those who can stop the process if they disagree.

Over the past 20 years, watershed managers have found a lot to like about involving interested parties in their work. Involving stakeholders:

- Builds trust and support for the process and product
- Shares responsibility for decisions or actions
- Creates solutions more likely to be adopted
- Leads to better, more cost-effective solutions
- Forges stronger working relationships
- Enhances communication and coordination of resources

It is important to note that public involvement processes can greatly enhance watershed management efforts, but they can't override laws and regulations enacted by elected officials and public agencies. In fact, stakeholder processes are used most often to support and complement legally required actions such as achieving water quality standards, protecting drinking water supplies, restoring habitat, and generally making the nation's waters fishable and swimmable.

Another important aspect of stakeholder involvement is utility. If you convene a group and don't somehow include their input in the process or product, they'll likely wonder why they wasted their time with you. Make sure that the contributions of stakeholders are both recognized and used in some manner to aid the goals of the watershed program.

Involving stakeholders throughout the watershed planning process

Stakeholders need to be involved at each stage of the watershed planning process. Their knowledge of local social, economic, political, and ecological conditions provides the yardstick against which proposed solutions must be measured. Also, the goals, problems, and remediation strategies generated by stakeholders define what's desirable and achievable. Weaving stakeholder input, legal requirements, and resource protection strategies into an integrated tapestry for managing surface water and groundwater resources is what the watershed approach is all about.



Using outreach to strengthen stakeholder efforts

Once you have identified your internal goals and objectives and developed a preliminary stakeholder framework, you need to start conducting outreach and education activities. If people are expected to exhibit concern over water resources, gather and process assessment information, and support preservation or restoration proposals, they must be engaged through a planned, long-term outreach program.

Outreach is a process that involves communicating information to an audience and getting a response from that audience. How you communicate the information (fact sheets, news articles, watershed festivals, web sites, etc.) will depend on the audience, the message you're trying to deliver, and your budget.

Inviting the stakeholders to participate

Once you've developed a list of stakeholders, invite them to participate in writing. To increase the chances of participation, tailor each letter with the reasons why they need to be involved in the project. For example, if you're trying to get representation from the building community, you might want to highlight the fact that no one from the building community is involved with the planning process.

Follow up your letter with a personal phone call to answer any questions and confirm their participation. Be prepared for resistance. If the potential stakeholders say they can't participate in the kickoff meeting, make sure you send them any information that comes out of the meeting and ask if there is someone from their organization who could attend in their place.

Top 12 tips to move the Stakeholder process forward:

- 1. Involve stakeholders as soon as possible.** Nothing can derail the process faster than asking for input after a decision has already been made.
- 2. Be honest.** Lay all of your cards on the table at the beginning. It's OK not to have the answers, but it's not OK to mislead the group.
- 3. Listen.** Often we are so focused on how we are going to respond to what is being said, that we miss what's being said altogether.
- 4. Communicate clearly and often.** Clear and frequent communication is essential. Do not assume your stakeholders understand all the issues and processes.
- 5. Recognize differences early on.** It's OK to disagree. If you try to ignore conflict or make people think they're one big happy family (when they know they're not), you lose credibility.
- 6. Don't leave out stakeholders because they're difficult.** Inviting those expressing opposition may cause initial discomfort, but they'll likely bring energy and new perspectives to the process.
- 7. Focus on their issues.** People will bring their own concerns and issues to the process. Instead of focusing on how you're going to meet your internal goals, concentrate on meeting their needs.
- 8. Establish mini-milestones.** Because stakeholder processes tend to be long and drawn out, it is important to achieve and build upon small successes to keep the group motivated.



9. **Commit the resources needed to achieve your objectives.** Make sure the needed resources will be available, but don't select activities that you know you won't be able to afford to implement.
10. **Call a meeting only when necessary.** Think long and hard before asking stakeholders to take time out of their schedules. Try to communicate information through flyers, e-mail, or web sites.
11. **Give feedback and praise.** Give feedback to the group to show them how their efforts are moving the process forward. Recognize key activities and participation by the stakeholders.
12. **Make it fun.** Although you're dealing with serious issues, that doesn't mean you can't have fun.



TASK 7: SPECIAL PROJECTS

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TASK 7: SPECIAL PROJECTS

Introduction

Special projects may be developed to address water quality concerns identified by CRP Partners and Steering Committees as priority issues for the basin. These special projects differ from special studies that involve water quality sampling activities outlined in Task 3.

Some types of special projects that may be considered under this task include:

- support of watershed protection plans and other nonpoint source pollution prevention related activities
- source water protection and assessment
- defining groundwater geology in reference to its potential impact on surface water quality
- water conservation planning efforts to help increase flow during low-flow periods
- investigation and evaluation of existing data to help define sources and/or causes

If more than one project is planned, each one should be defined as a sub-task (Task 7.1, Task 7.2, etc.) with separate plans, deliverables, and budgets. CRP Partners should work closely with their TCEQ Project Manager since most of these projects will require meetings to discuss and scope out project plans. At a minimum, project activities should be described for each quarter and provided with the Progress Report. If CRP funds are used to match activities under a federal grant, the amount of match and related activities need to be reflected in each Progress Report for Task 7.

Note: Certain special projects may not be considered allowable based on their outlined activities and ultimate function. As in the past, implementation projects are not allowable. It has also been determined that projects used to define instream flow needs for water supply functions do not fall within the focus of the CRP.

CRP Partners should involve local stakeholders in a collaborative effort to develop project plans and to secure additional resources. Existing forums, such as, the CRP Steering Committees, TMDL Watershed Committees, Source Water Assessment and Protection Committees, and Basin Water Planning Committees can be used to initiate and advance the water quality projects. Relevant issues should be made available to the public for review and comment through the CRP Partner's Web site, e-mail and letter distributions, and news releases.

Below are three options for how a CRP Partner may get involved in a water quality project in their basin:

- **Option #1:** (Least intensive) Partners support the water quality project taking place in their area and are present at the planning meetings. They provide their insight, knowledge, and recommendations for a more successful project.
- **Option #2:** Partners go beyond the general support at planning meetings by providing one time assistance in the field and some general guidance to aid in defining potential sources and causes.



- **Option #3:** At this level of participation, partners become the coordinating entity and follow the steps for the creation of a water quality project, while the TCEQ is in a supporting role. Partners organize the planning meetings, conduct source inventories, update and submit the information to the TCEQ, and complete an evaluation report. The report includes a description of the assessment results, maps and descriptions of the identified potential sources and causes, a monitoring plan, and a list of the most appropriate best management practices to address concerns identified during the project. The funding of this level of participation may be through TCEQ or other external funding sources.

Nonpoint Source Projects

Section 319(h) of the Clean Water Act (CWA) authorizes the distribution of federal funds for implementation of nonpoint source (NPS) pollution prevention and restoration activities. The 319(h) grant program supports three basic types of activities: assessment, implementation of best management practices (BMP), and development of Watershed Protection Plans. CRP funds may be used to support activities related to assessment and the development of Watershed Protection Plans, but not implementation. Eligible **assessment** activities involve the collection and analysis of information about NPS pollution, its effect on water quality in specific bodies of water, and the results of BMPs used to reduce NPS pollution. Special studies involving monitoring should be addressed in Task 3.

Watershed Protection Plans

Watershed Protection Plans are comprehensive plans designed to protect unimpaired waters and restore impaired waters. Grants for 319(h) projects are subject to a 40 percent local match on the part of the implementing entity and CRP activities related to the project can be used to help fulfill this match requirement.