STATE OF TEXAS TWDB Contract No. 1600012016

COUNTY OF TRAVIS General Revenue
FREESE AND NICHOLS, INC.

This Contract, (hereinafter "CONTRACT"), between the Texas Water Development Board (hereinafter "TWDB") and FREESE AND NICHOLS, INC. (hereinafter "CONTRACTOR"), is composed of two parts, SECTION I. SPECIFIC CONDITIONS AND EXCEPTIONS TO THE STANDARD AGREEMENT and SECTION II. STANDARD AGREEMENT. The terms and conditions set forth in SECTION I will take precedence over terms and conditions in SECTION II.

SECTION I. SPECIFIC CONDITIONS AND EXCEPTIONS TO STANDARD AGREEMENT

ARTICLE I. DEFINITIONS

For the purposes of this CONTRACT, the following terms or phrases shall have the meaning ascribed therewith:

1. TWDB - The Texas Water Development Board, or its designated representative

2. CONTRACTOR – FREESE AND NICHOLS, INC.

3. EXECUTIVE ADMINISTRATOR - The Executive Administrator of the TWDB or a designated representative

4. PARTICIPANT(S) – FREESE AND NICHOLS, INC.

5. REQUIRED INTERLOCAL AGREEMENT(S) - n/a

6. RESEARCH PROJECT - Explore and evaluate alternative methods to increase freshwater to the Nueces Delta

7. TWDB APPROVAL DATE - July 21, 2016

8. DEADLINE FOR CONTRACT EXECUTION - November 21, 2016

9. CONTRACT INITIATION DATE - July 21, 2016

10. STUDY COMPLETION DATE - June 30, 2017

11. CONTRACT EXPIRATION DATE – August 31, 2017

12. TOTAL STUDY COSTS - $50,000.00

13. TWDB SHARE OF THE TOTAL STUDY COSTS - the lesser of $50,000.00 or 100 percent of the total study costs or individual payment submission

14. LOCAL SHARE OF THE TOTAL STUDY COSTS – $0.00 in cash or 0 percent of the total study costs or individual payment submission

15. PAYMENT SUBMISSION SCHEDULE - Monthly

16. OTHER SPECIAL CONDITIONS AND EXCEPTIONS TO STANDARD AGREEMENT OF THIS CONTRACT

    Section II. Article III. Item No. 7 is deleted in its entirety.

SECTION II. STANDARD AGREEMENT

ARTICLE I. RECITALS

Whereas, on TWDB APPROVAL DATE, the TWDB considered providing the CONTRACTOR a grant to conduct a RESEARCH PROJECT;

Whereas, the CONTRACTOR and PARTICIPANT will commit the LOCAL SHARE OF THE TOTAL STUDY COSTS, if applicable, in cash and/or in-kind services to pay for the LOCAL SHARE OF THE TOTAL STUDY COSTS of this RESEARCH PROJECT;

Whereas, the CONTRACTOR is the entity who will act as administrator of the TWDB's research grant and will be responsible for the execution of this contract;

Whereas, on the TWDB APPROVAL DATE, the TWDB approved a research grant to CONTRACTOR;

Now, therefore, the TWDB and the CONTRACTOR, agree as follows:

ARTICLE II. PROJECT DESCRIPTION AND SERVICES TO BE PERFORMED

1. The TWDB enters into this CONTRACT pursuant to Water Code §§11.1491 and 16.058 as appropriate; Exhibit A, the original grant application, which is incorporated herein and made a permanent part of this CONTRACT.

2. The CONTRACTOR will conduct a RESEARCH PROJECT, as delineated and described in Exhibit A, according to the Scope of Work contained in Exhibit B.

3. A progress report, including results to date, will be provided to the EXECUTIVE ADMINISTRATOR monthly, throughout the project. Special interim reports on special topics and/or results will be provided as appropriate. Instructions for the progress report are shown in Exhibit E, TWDB Guidelines for a Progress Report.

4. Within the first 60 days of the commencement of this CONTRACT, CONTRACTOR will consult with TWDB staff to prepare a list of entities that potentially may be affected by the results of this RESEARCH PROJECT. On the STUDY COMPLETION DATE, this list will be reviewed and updated by the CONTRACTOR and submitted to the TWDB with the draft final report.

ARTICLE III. CONTRACT TERM, SCHEDULE, REPORTS, AND OTHER PRODUCTS

1. The CONTRACTOR has until the DEADLINE FOR CONTRACT EXECUTION to execute this CONTRACT and to provide acceptable evidence of any REQUIRED INTERLOCAL AGREEMENT(S) and the Contractors' ability to

provide the LOCAL SHARE OF THE TOTAL STUDY COSTS, if applicable, to the EXECUTIVE ADMINISTRATOR for approval or the TWDB's SHARE OF THE TOTAL STUDY COSTS will be rescinded.

2. The term of this CONTRACT shall begin and the CONTRACTOR shall begin performing its obligations hereunder on the CONTRACT INITIATION DATE and shall expire on the CONTRACT EXPIRATION DATE. Delivery of an acceptable final report prior to the CONTRACT EXPIRATION DATE shall constitute completion of the terms of this CONTRACT.

3. The CONTRACTOR will complete the Scope of Work and will deliver four (4) double-sided copies of a draft final report to the EXECUTIVE ADMINISTRATOR no later than the STUDY COMPLETION DATE. The draft final report will include the scope of work; a description of the research performed; the methodology and materials used; any diagrams or graphics used to explain the procedures related to the study; any data collected; an electronic copy of any computer programs, maps, or models along with an operations manual and any sample data set(s) developed under the terms of this CONTRACT; analysis of the research results; conclusions and recommendations; a list of references, a Table of Contents, List of Figures, List of Tables, an Executive Summary, and any other pertinent information. All final reports should be prepared according to Exhibit D, Guidelines for Authors Submitting Contract Reports to the Texas Water Development Board. After a 30-day review period, the EXECUTIVE ADMINISTRATOR will return review comments to the CONTRACTOR.

4. The CONTRACTOR will consider incorporating comments from the EXECUTIVE ADMINISTRATOR and other commentors on the draft final report into a final report. The CONTRACTOR will include a copy of the EXECUTIVE ADMINISTRATOR's comments in the final report. The CONTRACTOR will submit one (1) electronic copy of the entire final report in Portable Document Format (PDF) and five (5) bound double-sided copies of the final report to the EXECUTIVE ADMINISTRATOR no later than the sixty days (60) after the STUDY COMPLETION DATE.

5. The CONTRACTOR will submit one (1) electronic copy of any computer programs or models and an operations manual developed under the terms of this CONTRACT. In compliance with Texas Administrative Code Chapters 206 and 213 (related to Accessibility and Usability of State Web Sites), the digital copy of the final report will comply with the requirements and standards specified in statute. After a 30-day review period, the EXECUTIVE ADMINISTRATOR will either accept or reject the final report. If the final report is rejected, the rejection letter sent to the CONTRACTOR shall state the reasons for rejection and the steps the CONTRACTOR needs to take to have the final report accepted and the retainage released.

6. The CONTRACTOR will submit the most recent progress report with submittal of payments according to the PAYMENT SUBMISSION SCHEDULE. Progress reports shall be in written form and shall include a brief statement of the overall progress made since the last status report; a brief description of any problems that have been encountered during the previous reporting period that will affect the study, delay the

timely completion of any portion of this CONTRACT, inhibit the completion of or cause a change in any of the study's products or objectives; and a description of any action the CONTRACTOR plans to take to correct any problems that have been encountered.

7. The EXECUTIVE ADMINISTRATOR can extend the STUDY COMPLETION DATE and the CONTRACT EXPIRATION DATE upon written approval. The CONTRACTOR should notify the EXECUTIVE ADMINISTRATOR in writing within ten (10) working days prior to the STUDY COMPLETION DATE or thirty (30) days prior to the CONTRACT EXPIRATION DATE that the CONTRACTOR is requesting an extension to the respective dates.

ARTICLE IV. COMPENSATION AND REIMBURSEMENT

1. The TWDB agrees to compensate and reimburse the CONTRACTOR in a total amount not to exceed the TWDB's SHARE OF THE TOTAL STUDY COSTS for costs incurred and paid by the CONTRACTOR pursuant to performance of this CONTRACT. The CONTRACTOR will contribute local matching funds, if applicable, in sources and amounts defined as the LOCAL SHARE OF THE TOTAL STUDY COSTS. The TWDB shall reimburse the CONTRACTOR for one hundred percent (100%) of the TWDB's share of each invoice pending the CONTRACTOR's performance up to ninety percent (90%) of the total funding costs. Upon completion of a Final Report, and written acceptance of said Final Report by the EXECUTIVE ADMINISTRATOR, the TWDB shall pay the remaining ten percent (10%) to the CONTRACTOR upon submission of a final invoice.

2. The CONTRACTOR shall submit payments and documentation for reimbursement billing according to the PAYMENT SUBMISSION SCHEDULE and in accordance with the approved task and expense budgets contained in Exhibit C to this CONTRACT. The CONTRACTOR has budget flexibility within task and expense budget categories to the extent that the resulting change in amount in any one task or expense category does not exceed 35% of the total authorized amount by this CONTRACT for the task or category. Larger deviations shall require approval by EXECUTIVE ADMINISTRATOR or designee which will be documented through an Approved Budget Memorandum to the TWDB contract file. The CONTRACTOR will be required to provide written explanation for the overage and reallocation of the task and expense amount.
For all reimbursement billings including any subcontractor's expenses, the EXECUTIVE ADMINISTRATOR must have determined that the REQUIRED INTERLOCAL AGREEMENT(S) and contracts or agreements between the CONTRACTOR and the subcontractor are consistent with the terms of this CONTRACT. The CONTRACTOR is fully responsible for paying all charges by subcontractors prior to reimbursement by the TWDB.

3. The CONTRACTOR and its subcontractors shall maintain satisfactory financial accounting documents and records, including copies of invoices and receipts, and

shall make them available for examination and audit by the EXECUTIVE ADMINISTRATOR. Accounting by the CONTRACTOR and its subcontractors shall be in a manner consistent with Generally Accepted Accounting Principles.

4. By executing this CONTRACT, the CONTRACTOR accepts the authority of the State Auditor's Office, under direction of the legislative audit committee, to conduct audits and investigations in connection with any and all state funds received pursuant to this contract. The CONTRACTOR shall comply with and cooperate in any such investigation or audit. The CONTRACTOR agrees to provide the State Auditor with access to any information the State Auditor considers relevant to the investigation or audit. The CONTRACTOR also agrees to include a provision in any subcontract related to this CONTRACT that requires the subcontractor to submit to audits and investigation by the State Auditor's Office in connection with any and all state funds received pursuant to the subcontract.

5. The CONTRACTOR shall submit a progress report as described in Article II, Item 3 and the following documentation which documents the TOTAL STUDY COSTS for the reporting period even if the TOTAL STUDY COSTS is zero for reimbursement by the TWDB to the CONTRACTOR for the TWDB's SHARE OF THE TOTAL STUDY COSTS shall be submitted by the CONTRACTOR to the EXECUTIVE ADMINISTRATOR for reimbursement billing:

   A. Completed and Signed Payment Request Checklist which includes the following:
      (1) TWDB CONTRACT Number;
      (2) Billing period; beginning (date) to ending date;
      (3) Total Expenses for this period;
      (4) Total In-kind services;
      (5) Less LOCAL SHARE OF THE TOTAL STUDY COSTS for the billing period;
      (6) Total TWDB's SHARE OF THE TOTAL STUDY COSTS for the billing period;
      (7) Amount of retainage to be withheld for the billing period;
      (8) Total costs to be reimbursed by the TWDB for the billing period; and
      (9) Certification, signed by the CONTRACTOR's authorized representative, that the expenses submitted for the billing period are a true and correct representation of amounts paid for work performed directly related to this contract.

   B. For direct expenses incurred by the CONTRACTOR other than subcontracted work:
      (1) A spreadsheet showing the tasks that were performed; the percent and cost of each task completed; a total cost figure for each direct expense category including labor, fringe, overhead, travel, and other expenses such as communication and postage, technical and computer services, expendable supplies, printing and reproduction; and

(2) Copies of detailed, itemized invoices/receipts for other expenses (credit card summary receipts or statements are not acceptable).

C. For direct expenses incurred by the CONTRACTOR for subcontracted work:
(1) Copies of invoices from the subcontractors to the CONTRACTOR;
(2) A spreadsheet showing the tasks that were performed; the percent and cost of each task completed; a total cost figure for each direct expense category including labor, fringe, overhead, travel, and other expenses such as communication and postage, technical and computer services, expendable supplies, printing and reproduction; and the total dollar amount due to the consultant; and
(3) Copies of detailed, itemized invoices/receipts for other expenses (credit card summary receipts or statements are not acceptable).

D. For travel expenses for the CONTRACTOR and/or subcontractor(s) –
(1) Freese and Nichols, Inc.s, dates, work locations, time periods at work locations, itemization of subsistence expenses of each employee, limited, however, to travel expenses authorized for state employees by the General Appropriations Act, Tex. Leg. Regular Session, 2015, Article IX, Part 5, as amended or superceded. Receipts required for lodging;
(2) Copies of invoices or tickets for transportation costs or, if not available, Freese and Nichols, Inc.s, dates, and points of travel of individuals; and
(3) All other reimbursable travel expenses -- invoices or purchase vouchers showing reason for expense with receipts to evidence the amount incurred.

6. Incomplete requests will be returned to the CONTRACTOR if deficiencies are not resolved within ten (10) business days.

7. If for some reason the reimbursement request cannot be processed due to the need for an amendment to the CONTRACT, the CONTRACTOR will be required to resubmit the Payment Request Checklist dated after the execution of the amendment.

8. The CONTRACTOR is responsible for any food or entertainment expenses incurred by its own organization or that of its subcontractors, outside that of the travel expenses authorized and approved by the State of Texas under this CONTRACT.

9. A compliance report in accordance with Texas Administrative Code (TAC) Title 1, Part 5, Chapter 111, Subchapter B, Rule §111.14; The CONTRACTOR shall maintain business records documenting its compliance with the approved Historically Underutilized Business subcontracting plan in the format prescribed by the Texas Procurement and Support Services (Exhibit F). The compliance reports must include payment information on all HUB and non-HUB subcontractors. Submittal of these monthly compliance reports is required as a condition of payment.

The TWDB will monitor the HUB subcontracting plan monthly to ensure the value of the subcontracts meets or exceeds the HUB subcontracting provisions specified in the contract. CONTRACTOR who fails to implement the HUB subcontracting plan in good faith will be reported to Texas Procurement and Support Services. The TWDB may revoke the contract for breach of contract and make a claim against the contractor.

ARTICLE V. INTELLECTUAL PROPERTY: OWNERSHIP, PUBLICATION, AND ACKNOWLEDGMENT

1. "Use" of a work product, whether a CONTRACTOR Works, a Subcontractor Works or otherwise, shall mean and include, without limitation hereby, any lawful use, copying or dissemination of the work product, or any lawful development, use, copying or dissemination of derivative works of the work product, in any media or forms, whether now known or later existing.

2. "No Compensation Obligation" shall mean there is no obligation on the part of one co-owner or licensee of a work, whether a CONTRACTOR Works, a Subcontractor Works or otherwise, to compensate other co-owners, licensees or licensors of the work for any use of the work by the using co-owner or licensee, including but not limited to compensation for or in the form of: royalties; co-owner or licensee accounting; sharing of revenues or profits among co-owners, licensees or licensors; or any other form of compensation to the other co-owners, licensees or licensors on account of any use of the work.

3. "Dissemination" shall include, without limitation hereby, any and all manner of: physical distribution; publication; broadcast; electronic transmission; internet streaming; posting on the Internet or world wide web; or any other form of communication, transmission, distribution, sending or providing, in any forms or formats, and in or using any media, whether now known or later existing.

4. The TWDB shall have an unlimited, unrestricted, perpetual, irrevocable, non-exclusive royalty-free right to access and receive in usable form and format, and to use all technical or other data or information developed by CONTRACTOR and Subcontractor in, or otherwise resulting from, the performance of services under this CONTRACT.

5. For purposes of this Article, "CONTRACTOR Works" are work products developed by CONTRACTOR and Subcontractor using funds provided under this CONTRACT or otherwise rendered in or related to the performance in whole or part of this CONTRACT, including but not limited to reports, drafts of reports, or other material, data, drawings, studies, analyses, notes, plans, computer programs and codes, or other work products, whether final or intermediate.

    a. It is agreed that all CONTRACTOR Works shall be the joint property of the TWDB and CONTRACTOR.

b. The parties hereby agree that, if recognized as such by applicable law, the CONTRACTOR Works are intended to and shall be works-made-for-hire with joint ownership between the TWDB and CONTRACTOR as such works are created in whole or part.

c. If the CONTRACTOR Works do not qualify as works-made-for-hire under applicable law, CONTRACTOR hereby conveys co-ownership of such works to the TWDB as they are created in whole or part. If present conveyance is ineffective under applicable law, CONTRACTOR agree to convey a co-ownership interest of the CONTRACTOR Works to the TWDB after creation in whole or part of such works, and to provide written documentation of such conveyance upon request by the TWDB.

d. The TWDB and CONTRACTOR acknowledge that the copyright in and to a copyrightable CONTRACTOR Work subsists upon creation of the CONTRACTOR Work and its fixing in any tangible medium. CONTRACTOR or the TWDB may register the copyrights to such Works jointly in the Freese and Nichols, Inc.s of the CONTRACTOR and the TWDB.

e. The TWDB and CONTRACTOR each shall have full and unrestricted rights to use a CONTRACTOR Work with No Compensation Obligation.

6. For purposes of this Article, "Subcontractor Works" include all work product developed in whole or part by or on behalf of Subcontractors engaged by CONTRACTOR to perform work for or on behalf of any CONTRACTOR under this CONTRACT (or by the Subcontractors' Subcontractors hereunder, and so on). CONTRACTOR shall secure in writing from any Subcontractors so engaged:

a. unlimited, unrestricted, perpetual, irrevocable, royalty-free rights of the TWDB (and, if desired, of CONTRACTOR) to access and receive, and to use, any and all technical or other data or information developed in or resulting from the performance of services under such engagement, with No Compensation Obligation; and either

b. assignment by the Subcontractor to the TWDB (and, if desired by them, jointly to the CONTRACTOR) of ownership (or joint ownership with the Subcontractor) of all Subcontractor Works, with No Compensation Obligation; or

c. grant by Subcontractor of a non-exclusive, unrestricted, unlimited, perpetual, irrevocable, world-wide, royalty-free license to the TWDB (and, if desired by them, the CONTRACTOR) to use any and all Subcontractor Works, including the right to sublicense use to third parties, with No Compensation Obligation.

7. No unauthorized patents. CONTRACTOR Works and Subcontractor Works or other work product developed or created in the performance of this CONTRACT or

otherwise using funds provided hereunder shall not be patented by CONTRACTOR or their Subcontractor unless the EXECUTIVE ADMINISTRATOR consents in writing to submission of an application for patent on such works; and provided that, unless otherwise agreed in writing, any application made for patent shall include and Freese and Nichols, Inc. the TWDB (and, as applicable and desired by them, CONTRACTOR) as co-owners of the patented work:

a. no patent granted shall in any way limit, or be used by CONTRACTOR or Subcontractor to limit or bar the TWDB's rights hereunder to access and receive in useable form and format, and right to use, any and all technical or other data or information developed in or resulting from performance pursuant to this CONTRACT or the use of funds provided hereunder; and

b. the TWDB (and, if applicable, the CONTRACTOR) shall have No Compensation Obligation to any other co-owners or licensees of any such patented work, unless otherwise expressly agreed in writing.

8. CONTRACTOR shall include terms and conditions in all contracts or other engagement agreements with any Subcontractors as are necessary to secure these rights and protections for the TWDB; and shall require that their Subcontractors include similar such terms and conditions in any contracts or other engagements with their Subcontractors. For the purposes of this section, "Subcontractors" includes independent contractors (including consultants) and also employees working outside the course and scope of employment.

9. Any work products subject to a TWDB copyright or joint copyright and produced or developed by the CONTRACTOR or their Subcontractor pursuant to this CONTRACT or using any funding provided by the TWDB may be reproduced in any media, forms or formats by the TWDB or CONTRACTOR at their own cost, and be disseminated in any medium, format or form by any party at its sole cost and in its sole discretion. CONTRACTOR may utilize such work products as they may deem appropriate, including Dissemination of such work products or parts thereof under their own Freese and Nichols, Inc., provided that any TWDB copyright is noted on the materials.

10. The CONTRACTOR agrees to acknowledge the TWDB in any news releases or other publications relating to the work performed under this CONTRACT.

ARTICLE VI. AMENDMENT, TERMINATION, AND STOP ORDERS

1. This CONTRACT may be altered or amended by mutual written consent or terminated by the EXECUTIVE ADMINISTRATOR at any time by written notice to the CONTRACTOR. Upon receipt of such termination notice, the CONTRACTOR shall, unless the notice directs otherwise, immediately discontinue all work in connection with the performance of this CONTRACT and shall proceed to cancel promptly all existing orders insofar as such orders are chargeable to this CONTRACT. The CONTRACTOR shall submit a statement showing in detail the work performed under this CONTRACT

to the date of termination. The TWDB shall then pay the CONTRACTOR promptly that proportion of the prescribed fee, which applies to the work, actually performed under this CONTRACT, less all payments that have been previously made. Thereupon, copies of all work accomplished under this CONTRACT shall be delivered to the TWDB.

2. The EXECUTIVE ADMINISTRATOR may issue a Stop Work Order to the CONTRACTOR at any time. Upon receipt of such order, the CONTRACTOR shall discontinue all work under this CONTRACT and cancel all orders pursuant to this CONTRACT, unless the order directs otherwise. If the EXECUTIVE ADMINISTRATOR does not issue a Restart Order within 60 days after receipt by the CONTRACTOR of the Stop Work Order, the CONTRACTOR shall regard this CONTRACT terminated in accordance with the foregoing provisions.

ARTICLE VII. SUBCONTRACTS

Each Subcontract entered into to perform required work under this CONTRACT shall contain the following provisions:

a. a detailed budget estimate with specific cost details for each task or specific item of work to be performed by the Subcontractor and for each category of reimbursable expenses;

b. a clause stating that the Subcontract is subject to audit by the Texas State Auditor's Office and requiring the Subcontractor to cooperate with any request for information from the Texas State Auditor, as further described in Article X, Section 1, Paragraph D hereof;

c. a clause stating that payments under the Subcontract are contingent upon the appropriation of funds by the Texas Legislature, as further described in Article X, Section 1, Paragraph A hereof;

d. a clause stating that ownership of data, materials and work papers, in any media, that is gathered, compiled, adapted for use, or generated by the Subcontractor or the CONTRACTOR shall become data, materials and work owned by the TWDB and that Subcontractor shall have no proprietary rights in such data, materials and work papers, except as further described in Article V hereof;

e. a clause stating that Subcontractor shall keep timely and accurate books and records of accounts according to Generally Acceptable Accounting Principles as further described in Article X, Section 2, Paragraph H;

f. a clause stating that Subcontractor is solely responsible for securing all required licenses and permits from local, state and federal governmental entities and that Subcontractor is solely responsible for obtaining sufficient insurance in accordance with the general standards and practices of the industry or governmental entity; and

g. a clause stating that Subcontractor is an independent contractor and that the TWDB shall have no liability resulting from any failure of Subcontractor that results in breach of CONTRACT, property damage, personal injury or death.

ARTICLE VIII. LICENSES, PERMIT, AND INSURANCE

1. For the purpose of this CONTRACT, the CONTRACTOR will be considered an independent contractor and therefore solely responsible for liability resulting from negligent acts or omissions. The CONTRACTOR shall obtain all necessary insurance, in the judgment of the CONTRACTOR, to protect themselves, the TWDB, and employees and officials of the TWDB from liability arising out of this CONTRACT.

2. The CONTRACTOR shall be solely and entirely responsible for procuring all appropriate licenses and permits, which may be required by any competent authority for the CONTRACTOR to perform the subject work.

3. Indemnification. The CONTRACTOR shall indemnify and hold the TWDB and the State of Texas harmless, to the extent the CONTRACTOR may do so in accordance with state law, from any and all losses, damages, liability, or claims therefore, on account of personal injury, death, or property damage of any nature whatsoever caused by the CONTRACTOR, arising out of the activities and work conducted pursuant to this CONTRACT. The CONTRACTOR is solely responsible for liability arising out of its negligent acts or omissions during the performance of this CONTRACT.

ARTICLE IX. SEVERANCE PROVISIONS

Should any one or more provisions of this CONTRACT be held to be null, void, voidable, or for any reason whatsoever, of no force and effect, such provision(s) shall be construed as severable from the remainder of this CONTRACT and shall not affect the validity of all other provisions of this CONTRACT which shall remain of full force and effect.

ARTICLE X. GENERAL TERMS AND CONDITIONS

1. GENERAL TERMS.

   a. No Debt Against the State. This CONTRACT does not create any debt by or on behalf of the State of Texas and the TWDB. The TWDB's obligations under this CONTRACT are contingent upon the availability of appropriated funds and the continued legal authority of the TWDB to enter into this CONTRACT.

   b. Independent Contractor. Both parties hereto, in the performance of this contract, shall act in an individual capacity and not as agents, employees, partners, joint ventures or associates of one another. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purposes whatsoever.

c. Procurement Laws. The CONTRACTOR shall comply with applicable State of Texas procurement laws, rules and policies, including but not limited to competitive bidding and the Professional Services Procurement Act, Government Code, Chapter 2254, relating to contracting with persons whose services are within the scope of practice of: accountants, architects, landscape architects, land surveyors, medical doctors, optometrists, professional engineers, real estate appraisers, professional nurses, and certified public accountants.

d. Right to Audit. The CONTRACTOR and its Subcontractors shall maintain all financial accounting documents and records, including copies of all invoices and receipts for expenditures, relating to the work under this CONTRACT. CONTRACTOR shall make such documents and records available for examination and audit by the EXECUTIVE ADMINISTRATOR or any other authorized entity of the State of Texas. CONTRACTOR'S financial accounting documents and records shall be kept and maintained in accordance with Generally Accepted Accounting Principles. By executing this CONTRACT, the CONTRACTOR accepts the authority of the Texas State Auditor's Office to conduct audits and investigations in connection with all state funds received pursuant to this CONTRACT. The CONTRACTOR shall comply with directives from the Texas State Auditor and shall cooperate in any such investigation or audit. The CONTRACTOR agrees to provide the Texas State Auditor with access to any information the Texas State Auditor considers relevant to the investigation or audit. The CONTRACTOR also agrees to include a provision in any Subcontract related to this CONTRACT that requires the Subcontractor to submit to audits and investigation by the State Auditor's Office in connection with all state funds received pursuant to the Subcontract.

e. Force Majeure. Unless otherwise provided, neither CONTRACTOR nor the TWDB nor any agency of the State of Texas, shall be liable to the other for any delay in, or failure of performance, of a requirement contained in this CONTRACT caused by force majeure. The existence of such causes of delay or failure shall extend the period of performance until after the causes of delay or failure have been removed provided the non-performing party exercises all reasonable due diligence to perform. Force majeure is defined as acts of God, war, strike, fires, explosions, or other causes that are beyond the reasonable control of either party and that by exercise of due foresight such party could not reasonably have been expected to avoid, and which, by the exercise of all reasonable due diligence, such party is unable to overcome. Each party must inform the other in writing with proof of receipt within two (2) business days of the existence of such force majeure or otherwise waive this right as a defense.

2. STANDARDS OF PERFORMANCE.

a. Personnel. CONTRACTOR shall assign only qualified personnel to perform the services required under this CONTRACT. CONTRACTOR shall be responsible for ensuring that any Subcontractor utilized shall also assign only qualified personnel. Qualified personnel are persons who are properly licensed to perform the work and who have sufficient knowledge, skills and ability to perform the tasks and services required herein according to the standards of performance and care for their trade or profession.

b. Professional Standards. CONTRACTOR shall provide the services and deliverables in accordance with applicable professional standards. CONTRACTOR represents and warrants that he is authorized to acquire Subcontractors with the requisite qualifications, experience, personnel and other resources to perform in the manner required by this CONTRACT.

c. Antitrust. CONTRACTOR represents and warrants that neither CONTRACTOR nor any firm, corporation, partnership, or institution represented by CONTRACTOR, or anyone acting for such firm, corporation, partnership, or institution has (1) violated the antitrust laws of the State of Texas under the Texas Business & Commerce Code, Chapter 15, of the federal antitrust laws; or (2) communicated directly or indirectly the proposal resulting in this CONTRACT to any competitor or other person engaged in such line of business during the procurement process for this CONTRACT.

d. Conflict of Interest. CONTRACTOR represents and warrants that CONTRACTOR has no actual or potential conflicts of interest in providing the deliverables required by this CONTRACT to the State of Texas and the TWDB. CONTRACTOR represents that the provision of services under this CONTRACT will not create an appearance of impropriety. CONTRACTOR also represents and warrants that, during the term of this CONTRACT, CONTRACTOR will immediately notify the TWDB, in writing, of any potential conflict of interest that could adversely affect the TWDB by creating the appearance of a conflict of interest.

CONTRACTOR represents and warrants that neither CONTRACTOR nor any person or entity that will participate financially in this CONTRACT has received compensation from the TWDB or any agency of the State of Texas for participation in the preparation of specifications for this CONTRACT. CONTRACTOR represents and warrants that he has not given, offered to give, and does not intend to give at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor or service to any public servant in connection with this CONTRACT.

e. Interested Parties. All non-governmental CONTRACTORS are required to submit a Certificate of Interested Parties at the time the signed contract is submitted to the TWDB. The Certificate of Interested Parties (Form 1295) is a

sworn statement by the contracting business entity and must be submitted even if there is no interested party in the transaction. The Form 1295 and instructions for completing and submitting the form are available at: https://www.ethics.state.tx.us/tec/1295-Info.htm. The TWDB is prohibited from executing a contract unless the contracting business entity submits a completed Form 1295.

f. Proprietary and Confidential Information. CONTRACTOR warrants and represents that any information that is proprietary or confidential, and is received by CONTRACTOR from the TWDB or any governmental entity, shall not be disclosed to third parties without the written consent of the TWDB or applicable governmental entity, whose consent shall not be unreasonably withheld.

g. Public Information Act. CONTRACTOR acknowledges and agrees that all documents, in any media, generated in the performance of work conducted under this CONTRACT are subject to public disclosure under the Public Information Act, Government Code, Chapter 552. CONTRACTOR shall produce all documents upon request of the TWDB within two (2) business days when the documents are required to comply with a request for information under the Public Information Act.

h. Accurate and Timely Record Keeping. CONTRACTOR warrants and represents that he will keep timely, accurate and honest books and records relating to the work performed and the payments received under this CONTRACT according to generally accepted accounting standards. Further, CONTRACTOR agrees that he will create such books and records at or about the time the transaction reflected in the books and records occurs.

i. Dispute Resolution. The CONTRACTOR and the TWDB agree to make a good faith effort to resolve any dispute relating to the work required under this CONTRACT through negotiation and mediation as provided by Government Code, Chapter 2260 relating to resolution of certain contract claims against the state. The CONTRACTOR and the TWDB further agree that they shall attempt to use any method of alternative dispute resolution mutually agreed upon to resolve any dispute arising under this CONTRACT if this CONTRACT is not subject to Chapter 2260.

j. Contract Administration. The TWDB shall designate a project manager for this CONTRACT. The project manager will serve as the point of contact between the TWDB and CONTRACTOR. The TWDB's project manager shall supervise the TWDB's review of CONTRACTOR's technical work, deliverables, draft reports, the final report, payment requests, schedules, financial and budget administration, and similar matters. The project manager does not have any express or implied authority to vary the terms of the CONTRACT, amend the CONTRACT in any way or waive strict performance of the terms or conditions of the CONTRACT.

ARTICLE XI. CORRESPONDENCE

All correspondence between the parties shall be made to the following addresses:

For the **TWDB**:

Contract Issues:
Texas Water Development Board
Attention: Contract Administration P.O.
P.O. Box 13231
Austin, Texas 78711-3231
Email: contracts@twdb.texas.gov

Payment Request Submission: Texas Water Development Board Attention:
Accounts Payable
P.O. Box 13231
Austin, Texas 78711-3231
Email: invoice@twdb.texas.gov

Physical Address:
Stephen F. Austin State Office Building
1700 N. Congress Avenue
Austin, Texas 78701

For the **CONTRACTOR:**

Contract Issues:
Freese and Nichols, Inc.
10431 Morado Circle, Suite 300
Austin, Texas 78759
Email: David.buzan@freese.com

Payment Request Submission:
Freese and Nichols, Inc.
10431 Morado Circle, Suite 300
Austin, Texas 78759
Email: David.buzan@freese.com

Physical Address:
Freese and Nichols, Inc.
10431 Morado Circle, Suite 300
Austin, Texas 78759

IN WITNESS WHEREOF, the parties have caused this CONTRACT to be duly executed in multiple originals.

TEXAS WATER DEVELOPMENT BOARD

Jeff Walker
Executive Administrator

Date: 10.13.16

FREESE AND NICHOLS, INC.

Thomas C. Gooch

Tom Gooch
Principal/Vice President

Date: 10/3/2016

EXHIBIT A

ORIGINAL GRANT APPLICATION

Texas Water Development Board

Explore and Evaluate Alternative Methods to Increase Freshwater to the Nueces Delta

Response to RFQ No. 580-16-RFQ0025

April 6, 2016

Submitted by
Freese and Nichols, Inc.
10431 Morado Circle, Suite 300
Austin, Texas 78759

Contact
David Buzan
Project Manager
512-617-3164
david.buzan@freese.com

Copy

FREESE AND NICHOLS
Innovative approaches
Practical results
Outstanding service
10431 Morado Circle, Building 5, Suite 300 • Austin, Texas 78759 • 512-617-3100 • fax 512-617-3101
www.freese.com

April 6, 2016

Texas Water Development Board
1700 N. Congress Avenue
6th Floor Reception Desk
Austin, Texas 78701

Re: Explore and Evaluate Alternative Methods to Increase Freshwater to the Nueces Delta, 580-16-RFQ0025

Dear Selection Committee:

Freese and Nichols, Inc. (FNI) is excited about the opportunity to help the Nueces Estuary Advisory Council, Nueces Basin and Bay Area Stakeholder Committee and the state to explore and evaluate alternative strategies for increasing freshwater inflow to the Nueces estuary. Increasing freshwater inflow to the Nueces/Rincon delta has been an issue for more than 30 years and will require creativity to identify feasible strategies. The FNI team offers the stakeholders and the Texas Water Development Board (TWDB) a fresh perspective on alternative methods to meet the freshwater inflow needs of this important estuary.

FNI team members have worked on water quality and freshwater inflow issues in Nueces Bay for more than 20 years and have served on the Nueces Basin and Bay Area Expert Science Team. Team members have drafted freshwater inflow strategies for the estuary in the past, which were provided to the Coastal Bend Bay and Estuary Program. Team members Alan Plummer Associates and HUB partners AmaTerra Environmental and Crespo Consulting Services bring valued technical and administrative skills to the project. The FNI team has focused environmental flows experience, significant water supply infrastructure expertise, a depth of resources and, most importantly, a strong desire to support environmental stewardship by helping the state and stakeholders maintain healthy estuaries.

This team will create a decision tool for use in evaluating strategies for increasing freshwater inflow to the delta and estuary. A comprehensive list of potential strategies will be documented in an alternatives matrix, along with constraints criteria to assist stakeholders in the ranking of alternatives. Additionally, the following information will be included in the decision matrix for each strategy: quantity of freshwater, periods/seasons when freshwater would be available, sites where water could be delivered, obstacles (physical, administrative and permitting), estimated cost of implementation, potential environmental benefits and impacts, possible funding sources, and recommended parties to implement the strategy.

Please feel free to contact us with any comments or questions.

Sincerely,

Tom Gooch

Tom Gooch, P.E.
Principal/Vice President

David Buzan

David Buzan
Project Manager

Table of Contents

Item 1
Execution of Statement of Qualifications — Page 3

Item 2
Company Profile Summary and History — Page 4

Item 3
Resumes of Individuals — Excluded

Item 4
HUB Subcontracting Plan — Page 6

Item 5
Ownership of Business Entity — Page 7

Item 6
Technical Approach — Page 8

Appendix
Addendum No. 1

Conflict of Interest Statement

Freese and Nichols, Inc. (FNI) does not have any business interest or relationships that could reasonably be considered to pose possible conflicts of interest in the respondent's performance of the contract obligations. In the performance of services under the contract, (1) FNI does not have and will not have any actual or potential conflict of interest, and (2) FNI will take whatever reasonable actions may be necessary and prudent to avoid even the appearance of impropriety.

ITEM 1: EXECUTION OF STATEMENT OF QUALIFICATIONS

Execution of Statement of Qualifications
to the
Request for Qualifications

COMPANY NAME: Freese and Nichols, Inc.

ADDRESS: 4055 International Plaza, Suite 200
Fort Worth, Texas 76109

PHONE NUMBER: 817-735-7300

E-MAIL: tom.gooch@freese.com

I, **Tom Gooch**, am the above-referenced company's representative and I am authorized to submit this proposal and sign future Contract documents.

Tom Gooch

Authorized Signature

April 6, 2016

Date

ITEM 2: COMPANY PROFILE SUMMARY AND HISTORY

A. COMPANY NAME, ADDRESS, PHONE NUMBER AND LEGAL STATUS

Freese and Nichols, Inc.
4055 International Plaza, Suite 200
Fort Worth, Texas 76109
817-735-7300

FNI is a privately held corporation.

B. NAME AND TITLE OF PERSON SUBMITTING THE PROPOSAL WITH THE AUTHORITY TO BIND THE COMPANY

Tom Gooch, P.E.
Vice President/Principal | Principal-in-Charge

C. NAME, PHONE NUMBER AND EMAIL ADDRESS OF CONTACT PERSON FOR ANY QUESTIONS ON THE PROPOSAL

David Buzan
Project Manager
512-617-3164
david.buzan@freese.com

D. DESCRIBE THE GENERAL NATURE OF PREVIOUS WORK, THE NUMBER OF YEARS IN BUSINESS, SIZE AND SCOPE OF OPERATION

Years in Business

FNI has been in business for 122 years, tracing its roots to 1894, when founder John Hawley became one of first independent consultants for water projects in Texas.

FNI has worked with the Texas Water Development Board (TWDB) since the severe drought of the 1950s, when TWDB began providing the state with direction for the conservation and responsible development of water in Texas. FNI has also worked closely with TWDB since the inception of Senate Bill (SB) 1 regional water supply plans. FNI has five scientists serving on SB 3 expert science teams.

Nature of Previous Work

Although FNI provides its clients—water districts, river authorities and municipalities, as well as military, government and higher education clients—with a full range of engineering services, more than 50 percent of our business remains in water-related engineering and planning services.

FNI's partnership with Alan Plummer Associates, AmaTerra Environmental, and Crespo Consulting Services, combined with its working relationships with environmental flows stakeholders in the Nueces Basin, Texas Commission on Environmental Quality (TCEQ) and Texas Parks and Wildlife Department (TPWD), will provide TWDB and the stakeholders with an experienced partner in the exploration of freshwater inflow strategies for the Nueces Delta.

Size and Scope of Operation

FNI is a multi-discipline environmental science, engineering, planning, construction services and architecture firm with more than 550 employees in offices throughout Texas, Oklahoma, North Carolina and Georgia. FNI is committed to client service and long-term, mutually beneficial relationships.

FNI's Subconsultant Team Members

Alan Plummer Associates (APAI), has conducted business with quality and integrity for more than 37 years. A regional firm founded in 1978 with a vision to uphold environmental stewardship and technical excellence, APAI is committed to serving its clients with distinction. Today, with nearly 90 employees and four Texas offices in Fort Worth, Dallas, Austin, and Houston, as well as locations in College Station, Texas, and Oklahoma City, Oklahoma; APAI continues that commitment. Dedicated to water resources and environmental engineering, APAI balances sound engineering principles with innovative technology tailored to clients' needs. APAI's focus stays on developing cost-effective solutions for its clients.

AmaTerra Environmental, Inc. through its recent acquisition of Ecological Communications Corporation (EComm) is an environmental consulting firm specializing in the National Environmental Policy Act (NEPA) process and documentation requirements for Environmental Assessments (EAs), Environmental Impact Statements (EISs), and Categorical Exclusions (CEs), as well as related applicable laws and regulations, including the National Historic Preservation Act (NHPA), the Endangered Species Act, the Migratory Bird Treaty Act, the Clean Water Act, and the Clean Air Act.

AmaTerra's staff is experienced, proficient, and has shown superior performance in conducting and preparing the documentation for natural, social, and cultural resource studies. Such studies have included facility inventories, site evaluations, alternatives development and analysis, public involvement programs, visual resource analyses, environmental baseline studies, wetland identifications and delineations, water quality analyses; aquatic resource assessments, floodplain impact studies, wildlife habitat evaluations, forestry studies, threatened and endangered (T&E) species surveys, air quality analyses, noise studies, community impact studies, economic analyses, and historic and archeological studies.

Crespo Consulting Services, Inc. (Crespo) is a Texas civil and environmental engineering firm specializing in drainage, water quality, hydrology, hydraulics, erosion control and other related environmental studies. Crespo has continuously provided water quality, watershed planning, and engineering expertise throughout Texas since its inception in 1994. Firm staff bring over 30 years of experience analyzing and implementing innovative solutions to address flood control and water quality problems. Crespo's experience includes a full range of hydrologic, hydraulic and water quality services, including: monitoring, data analysis, modeling, design, and development of technical criteria.

Project experience comparable to this project includes: WAM studies of most to the Texas basins, a Basin and Bay Expert Science Team (BBEST) flow study, and water quality data analysis for reservoir water quality modeling projects. Data analysis for these projects include, flow and water quality statistical and trend analyses, and GIS. Many of the comparable projects have been performed in conjunction with FNI.

ITEM 3: RESUMES OF INDIVIDUALS

David Buzan

** Experience prior to FNI*

Project Manager and Environmental Assessments

EXPERIENCE
38 years

EDUCATION
M.S., Biology, Southwest Texas State University

B.S., Wildlife and Fisheries Science, Texas A&M University

REGISTRATION
TxDOT Precertified:

2.6.2 Impact Evaluation Assessments

2.6.3 Biological Surveys

AFFILIATIONS
American Fisheries Society

David Buzan is an FNI Coastal Ecologist and Project Manager with 38 years of experience working along the Texas coast. Before beginning work as a consultant, David worked for TCEQ for 14 years followed by 14 years with TPWD. From 1998 to 2006, he managed TPWD's Coastal Studies team. He and his staff:

- Analyzed freshwater inflow needs for the state's estuaries
- Guided and participated in marsh restoration projects in Galveston Bay, including participation in the Houston Ship Channel deepening and widening beneficial uses group
- Reviewed permit applications to the Galveston District of the U.S. Army Corps of Engineers (USACE)
- Responded to fish kills, harmful algal blooms and pollution incidents
- Conducted educational outreach events about coastal ecosystems

During his tenure at TPWD, David founded state-wide, multiagency workgroups on freshwater inflow analysis, harmful algal blooms, and seagrass monitoring. He and his team developed biological verification analysis for freshwater inflow predictions for Nueces Bay, Sabine Lake, Galveston Bay and the Laguna Madre. He participated in the Lower Colorado River Authority's (LCRA) 2007 freshwater inflow analysis for Matagorda Bay.

From 1981 through 1991, he directed TCEQ's Surface Water Quality Monitoring Program. He led and participated in multiple water quality and hydrological surveys along the coast from the Sabine-Neches Ship Channel south to the Rio Grande. During his career with the state, David participated in intensive freshwater inflow surveys for Nueces Bay, Sabine Lake, Galveston Bay, Matagorda Bay, Lavaca Bay, San Antonio Bay and the Laguna Madre.

A SAMPLING OF RELEVANT PROJECT EXPERIENCE

ENVIRONMENTAL FLOW EXPERT SCIENCE TEAMS* | TEXAS WATER DEVELOPMENT BOARD | TEAM MEMBER | Served on the environmental flow expert science teams for Nueces Bay (served on the Freshwater Inflow subcommittee), Galveston Bay, Matagorda Bay, Lavaca Bay and the Lower Laguna Madre. The science teams were tasked with estimating freshwater inflow needs for ecologically sound bays.

ENVIRONMENTAL SENSITIVITY INDEX UPDATES | TEXAS GENERAL LAND OFFICE, TEXAS COAST | PROJECT MANAGER | Biological and GIS services to update the environmentally sensitive features along the Gulf Coast and coastal waters in response to coastal oil spills. The updated documents

help guide oil spill response to minimize impact to important coastal habitats and species. David guided FNI's revision of priority protection areas coast-wide and updated important biological data for the lower half of the coast.

OYSTER REEF RESTORATION DECISION TOOL | TEXAS PARKS AND WILDLIFE DEPARTMENT, TEXAS COAST | PROJECT MANAGER | Developed a tool for TPWD to use in creating and restoring oyster reefs. The project emphasized recovery of reefs buried by sediments like those in East Galveston Bay after Hurricane Ike. David combed through nearly 200 scientific articles and interviewed more than 20 national and international experts to gather information for the tool, which was provided to TPWD in April 2015. The tool identifies 14 techniques, some proven and some experimental for recovering and creating oyster reefs.

HALF MOON REEF RESTORATION* | THE NATURE CONSERVANCY, MATAGORDA BAY, TEXAS | PROJECT MANAGER | Led the design, environmental assessment development, permit application and construction oversight for the creation of a 50-acre reef complex in Matagorda Bay.

SUNDOWN ISLAND RESTORATION PROJECT | AUDUBON TEXAS, MATAGORDA BAY | PROJECT MANAGER | Review of island erosion and development of alternatives to protect and expand the island. The island is important habitat for nearly 20 species of colonial water bird. This project involved facilitating three steering committee meetings with representatives of universities and state and federal agencies. FNI worked on this project which was finished in 2014 as a subcontractor after David moved to FNI.

SAN LUIS PASS SEDIMENT PROJECT* | TEXAS GENERAL LAND OFFICE | PROJECT MANAGER | Managed the project involving mapping seagrasses and oysters around San Luis Pass and coordinating communication with state and federal agencies on behalf of the Texas General Land Office. The project evaluated the suitability of using the San Luis Pass flood shoal as a sand source for restoration projects.

SABINE-NECHES SHIP-CHANNEL IMPROVEMENT PROJECT* | USACE GALVESTON DISTRICT | QUALITY ASSURANCE LEADER | Quality-assured the USACE wetland valuation analysis to calculate project impacts to wetlands and designed the mitigation monitoring plan for the project. Conducted the climate change analysis for the environmental impact statement (EIS).

MATAGORDA SHIP CHANNEL DEEPENING AND WIDENING* | URS, MATAGORDA BAY, TEXAS | PROJECT SCIENTIST | Conducted an independent third-party review of the EIS' oyster mitigation plan. The EIS was for the proposed deepening and widening of the Matagorda Ship Channel.

Tom Gooch, P.E.

Project Principal and Water Rights/Availability

Tom Gooch is one of Texas' most experienced water resource planners, especially in the development of SB 1 Regional Water Plans since the program's inception. ***He has provided leadership to FNI's involvement in the development of water supply plans for nine of the state's 16 planning regions.*** An FNI Vice President/Principal and the firm's Water Resources Planning Group Manager, Tom's background covers water supply planning, analyses of water rights, reservoir operation studies, water quality evaluations, analyses of flooding, preliminary design and cost estimates for water supply projects and transmission systems, economic analyses, and water and sewer rate studies.

EXPERIENCE

39 years

EDUCATION

M.S., Civil Engineering (Water Resources), Stanford University

B.S., Civil Engineering (Water Resources), Massachusetts Institute of Technology

REGISTRATION

Professional Engineer, Texas #50668

A SAMPLING OF RELEVANT PROJECT EXPERIENCE

SB 1 REGION C REGIONAL WATER SUPPLY PLAN | NORTH TEXAS MUNICIPAL WATER DISTRICT | PROJECT MANAGER | Region C's only consulting team since the inception of SB 1 Planning. Developed accurate, high-quality and on-time regional plans that have been repeatedly commended by TWDB. Developed reasonable population and demand projections through individual contact and surveys with each of Region C's 41 wholesale water providers and 357 water-user groups.

BASINWIDE WATER RESOURCES PLAN | SULPHUR RIVER BASIN AUTHORITY | PRINCIPAL-IN-CHARGE | Comprehensive plan for water resources development that addresses immediate and long-term water resources needs for in-basin clients and Metroplex water users. Responsible for scope development, funding coordination, integration and oversight of technical studies, environmental compliance, and client/stakeholder relationships.

WATER RIGHTS PERMITTING FOR SYSTEM OPERATIONS PERMIT | BRAZOS RIVER AUTHORITY (BRA) | PROJECT MANAGER | Analysis of BRA's 12-reservoir system, which allowed it to apply the water supply benefits of a coordinated system. Updated the existing water availability models (WAM). Allowed BRA to meet 2030 water-supply requirements without the construction of new reservoirs in a cost-effective and environmentally responsible manner.

LONG-RANGE WATER SUPPLY DEVELOPMENT | CITY OF CLEBURNE | SENIOR TECHNICAL ADVISOR | Project included master planning, water supply strategies, public outreach, permitting, environmental services, conjunctive-use strategies, Safe Drinking Water Act (SDWA) assessment, blending/treatment, reliability/risk analysis, infrastructure and financial/funding services. FNI obtained TWDB State Water Plan funding for this project.

WATER SUPPLY PLANNING ASSISTANCE | NORTH TEXAS MUNICIPAL WATER DISTRICT (NTMWD) | PROJECT MANAGER | Developed water demand projects for more than 80 customers of NTMWD for 2010, 2015, 2020, 2025 and 2035 conditions.

Bill Thaman, P.E.

Conceptual Engineering/Costs

** Experience prior to FNI*

Bill Thaman is an FNI Associate and Water Resource Project Manager for a variety of water resources planning studies. His background includes larger-scale plans for Region K Regional Water Plan and Groundwater Management Area 14. His experience includes studies to develop an Engineering Feasibility Report for a regional conjunctive-use system in Gonzales County and to develop the regulatory approach and facilities plan for a regional conjunctive-use system in Montgomery County. Bill recently managed the Houston-Galveston Subsidence District's Regulatory Plan Update, which won a Gold Medal in the 2014 Texas ACEC Engineering Excellence Awards.

A Sampling of Relevant Project Experience

» **Regulatory Plan Update | Harris-Galveston Subsidence District (HGSD) |** Project Manager | Served in multiple capacities on this multi-year, multi-discipline project: Project Manager, Project Engineer, and GIS/Data Management Software Designer/Programmer. The project included detailed population and water demand projections, groundwater model updates, development of a subsidence predictive model for Harris, Galveston, Fort Bend, Montgomery, and Brazoria Counties, and development of long-term regulatory plans for Harris, Galveston and Fort Bend Counties aimed at protecting the Houston region's groundwater resources.

The GIS and data management component was extensive and involved the development of custom GIS software to perform a number of critical tasks, including spatial distribution of population projections, water demand projections, and distribution of groundwater pumping to a finite-difference model grid covering the greater Houston area. Historic water use data was integrated into a single SQL Server dataset from multiple sources: TWDB water use survey, subsidence district water use database, and groundwater district historic use databases.

For large water users, interviews were conducted to develop an accurate spatial distribution of water use, and to develop accurate historic use for industrial customers. TCEQ Public Water System (PWS) data was used to spatially distribute historic groundwater use. Resultant historic water use and population data were used to develop per-capita water use rates for all PWS', and population/distance weighted gallons per capita per day (GPCD) were developed for future growth areas.

The Houston Area Groundwater Model (HAGM) was developed as part of this project by the consultant team and U.S. Geological Survey (USGS): projected pumpage input datasets were developed from

Experience
17 years

Education
M.S., Water Resources, Texas A&M University
B.S., Materials Engineering, Texas A&M University

Registration
Professional Engineer, Texas #84024

project data for multiple regulatory scenarios. HAGM water level and subsidence results were used to guide the update of HGSD's regulatory plan.

Much of this work was performed using custom software written in VB.Net with an ArcSDE SQL Server back-end. Custom Python scripts were developed to perform intermediate geoprocessing and automated map production. All work was documented in detailed reports, and recommendations were made to the HGSD and Fort Bend Subsidence District (FBSD) boards during multiple project status update meetings.

» **DESIRED FUTURE CONDITIONS (DFC) DEVELOPMENT | GROUNDWATER MANAGEMENT AREA (GMA) 14 |** CONSULTANT PROJECT ENGINEER (2016 REGIONAL WATER PLANNING CYCLE) | Gathered input from the GMA 14 members regarding projected levels of pumpage, coordinated a series of Groundwater Availability Model (GAM) runs using the newly developed HAGM, and assisted the GMA in developing DFC statements for each of the GMA counties. Prepared DFC statement document and made recommendations to the GMA.

» **MIDBASIN WATER SUPPLY PROJECT STUDY (MBWSP), GUADALUPE-BLANCO RIVER AUTHORITY (GBRA) |** PROJECT ENGINEER | Development of an Engineering Feasibility Report for the MBWSP with financial assistance through TWDB. The MBWSP will bring new potable water supplies to rapidly growing communities and future growth areas along the IH 35 and SH 130 corridors. FNI is currently working with GBRA to identify the most feasible project and phasing of project facilities to meet customer needs. Multiple recommendations were presented to GBRA management.

» **PERMITTING SYSTEM DESIGN SPECIFICATIONS | BRAZORIA COUNTY GROUNDWATER CONSERVATION DISTRICT** | PROJECT ENGINEER | Development of design specifications for a web-based permitting system constructed using ASP.NET. Performed data modeling, database design, and Graphical User Interface (GUI) design for a system that will maintain permitting, historic water use, water quality, pumpage, and well construction data for the District.

» **GROUNDWATER REDUCTION PLAN (GRP) FEASIBILITY STUDY* | LONE STAR GROUNDWATER CONSERVATION DISTRICT |** PROJECT MANAGER | Preparation and development of surface water conversion plans for the District. Activities include development of per-capita water use rates, water demand projections, water system transmission alignment studies, water system sizing, water distribution modeling, water facility evaluation and capacity assessments, and coordination of engineering activities for the District.

Augusto Villalón, P.E.

Alternatives Evaluation

** Experience prior to FNI*

Augusto Villalón is a Water Resources Account Director and Senior Project Manager whose experience in water resources ranges from regional planning to complete engineering design of water supply and wastewater facilities. He is experienced in water availability studies, bay and estuary freshwater inflow evaluations, local and large-scale regional water supply planning and design of raw and potable water supply facilities. Augusto has significant experience in comprehensive water supply planning, including identifying and working with diverse stakeholders in development of innovative projects. He has considerable experience in the evaluation and siting off-channel reservoirs and raw water conveyance facilities.

A Sampling of Relevant Project Experience

Lower Colorado River Authority/San Antonio Water System Water (SAWS) Project | Lower Colorado River Authority, Austin, Texas | Deputy Project Manager | Management and oversight of the conceptual engineering phase. Responsibilities included siting 24 reservoirs, six river intakes, 12 pumping stations, and transmission lines; and evaluating alternatives to assess feasible options. Established evaluation criteria and methodologies used to assess and rank cost-effective alternatives to deliver up to 150,000 acre-feet per year from the Lower Colorado River Basin to the San Antonio metro area.

Water Supply Study | Northwest Florida Water Management District, Tallahassee, Florida | Project Manager | Conceptual design of a regional surface water system (25 MGD) for Okaloosa County, Florida. In addition to management responsibilities, Augusto 1) developed siting criteria and evaluation matrices for technical, environmental, financial and land use constraints associated with surface water facilities; 2) developed run of river yields for the Shoal River; and 3) prepared detailed economic analysis for five alternative projects.

SB 1 Region H Water Plan Group* | Texas Water Development Board, Southeast Texas | Senior Lead Engineer | Regional, long-range planning study to examine the water needs and supply sources for communities in a 15-county area in Southeast Texas over the next 50 years. Determined water demands for multiple uses, determined reliability of surface water supplies for the major area providers, evaluated the impact of Region C and H water management strategies on freshwater inflows to Galveston Bay, prepared conceptual water management strategies, developed facility unit cost estimates and prepared conceptual capital and operations/maintenance cost estimates.

Experience
28 years

Education
M.S., Civil Engineering (Water Resources), University of South Florida
B.S., Civil Engineering, University of South Florida

Registration
Professional Engineer, Texas #81581 and Florida #67804

Rebecca Batchelder, P.E.

Conceptual Engineering/Costs

** Experience prior to FNI*

Rebecca Batchelder is an Environmental and Water Resource Engineer with nine years of project-based experience. She has expertise in the areas of regional water resource modeling and planning, environmental permitting, and Low Impact Development/Best Management Practice design. Rebecca worked in Texas for six years, including a stint assisting the development of the State Water Plan at TWDB and at a small engineering consulting firm where she designed several water quality improvement projects for the Austin Watershed Protection Department, participated in the Environmental Commissioning Team for Austin's Water Treatment Plant 4, and supported several environmental litigation efforts.

A Sampling of Relevant Project Experience

Los Angeles Stormwater Capture Master Plan* | Los Angeles Department of Water and Power, Fannin County, TX | Assistant Project Manager | 20-year plan to increase local water supply through the capture of stormwater using both distributing programs and centralized stormwater infiltration facilities.

Los Angeles River Diversion and Beneficial Use - the LA River Water Wheel* | Metabolic Studio | Assistant Project Manager | Project that will dam the Los Angeles River and divert water to a 72-foot water wheel that will convey LA River water to nearby parks to be used for irrigation.

West Basin Municipal Water District Desalination Subsurface Intake Study* | West Basin MWD | Assistant Project Manager | The goal of this project is to develop a decision matrix that can be applied throughout California to assist desalination project proponents, regulators, and other interested parties determine which, if any, subsurface intake technologies could be used provide supply water to proposed desalination plants. Additionally, this project includes a detailed investigation into West Basin's currently proposed desalination project site.

Proposition O BMP Optimization Study* | City of Los Angeles, CA | Assistant Project Manager | The goal of this project is to evaluate natural treatment systems that were constructed by the City of Los Angeles with funding from Proposition O to assist in meeting TMDL requirements, and provide recommendations for improved functioning.

Central/West Coast Basins Distributed and Regional Stormwater Capture Feasibility Study* | Groundwater Replenishment District of Southern California | Project Manager | Investigation of alternatives to capture more stormwater for groundwater recharge for the Water Replenishment District of Southern California for the Central and West Coast Groundwater Basins.

Experience
11 years

Education
M.S., Water Resources and Environmental Engineering, Tufts University
B.S., Environmental Engineering, Tufts University

Registration
Professional Engineer, Texas #105875

Peggy Glass, Ph.D.

Salinity/Water Quality

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS

EXPERIENCE
40 years

EDUCATION
Doctorate, Analytical Chemistry, University of Texas at Austin

B.S., Chemistry, Southwest Texas State University

Peggy Glass' experience in the Coastal Bend and Nueces Bay area began more than two decades and has included a wide range of water quality modeling and regulatory projects. Peggy specializes in regulatory support for water and wastewater utilities; water quality standards development and implementation; and water quality impacts analysis for dissolved oxygen, nutrients, toxics, pathogens and whole effluent toxicity. She has extensive experience with water quality issues in the Nueces Delta and Rincon Bayou.

A SAMPLING OF RELEVANT PROJECT EXPERIENCE

NUECES RIVER DELTA COORDINATION AND RINCON BAYOU DIVERSION | CITY OF CORPUS CHRISTI | PROJECT LEAD | From 2003 to 2008, Peggy led a project to assist the City of Corpus Christi with coordination with researchers performing a multi-year water, vegetation and avian monitoring program of the Nueces Delta. The program was funded by the City. Peggy's role was to coordinate with various researchers on the monitoring programs, review and evaluate data as it was acquired, evaluate each year's proposed programs by the researchers, review reports prepared by the researchers, and assist with implementation of presentations of data and observations by the researchers.

The research was needed because the Nueces Delta receives limited freshwater and tidal inflows as a result of natural and man-induced physical conditions, causing periodic hypersalinity and reduced productivity in this portion of the estuary. Various programs have been implemented in recent years to enhance inflows to the Delta and, thereby, to increase productivity. However, a comprehensive monitoring program was needed to quantify conditions in the Delta and potential benefits of freshwater inflow programs.

Two Delta freshwater inflow programs evaluated in this project were the Rincon Bayou Nueces Delta (RBND) project and the Allison Effluent Diversion Demonstration Project (EDDP). The RBND is an ongoing project to divert water from the Nueces River above the salt water barrier into the Rincon Bayou. Initially, this was accomplished with a cut from the Nueces River directly into the Rincon Bayou by gravity flow. Diversion was later enhanced with a pump station from the river to the Rincon. The Allison EDDP enabled the diversion of up to 2 MGD of treated effluent into the Nueces Delta. Peggy worked to get the Allison discharge permit amended to allow the diversion.

NUECES RIVER TIDAL DISSOLVED OXYGEN STANDARD | CITY OF CORPUS CHRISTI | PROJECT LEAD | Peggy led a project to work with TCEQ to modify the dissolved oxygen standard in the Nueces River below the Allison Wastewater Treatment Plant discharge. Peggy led the modeling effort to

demonstrate a lower dissolved oxygen (DO) standard was appropriate. The resulting modified standard saved the City millions of dollars in upgrades that would have been necessary to the Allison plant.

ALLISON WASTEWATER TREATMENT PLANT AMMONIA LIMIT PERMIT SUPPORT | CITY OF CORPUS CHRISTI | PROJECT MANAGER | The City retained APAI to work with TCEQ regarding a draft requirement in a new permit for the plant to incorporate an ammonia limit for the discharge to the Allison Effluent Demonstration Diversion Project (EDDP). Such a limitation would have required significant improvements to the plant to accommodate the new limits, without any significant benefit. APAI assisted the City with negotiations with TCEQ to modify language regarding the ammonia limit and whole effluent toxicity provisions. Due to Peggy's efforts, TCEQ allowed the City to monitor ammonia concentrations in the effluent and shut off the discharge to the Delta prior to ammonia levels exceeding the limit.

OSO BAY DISSOLVED OXYGEN MODELING | CITY OF CORPUS CHRISTI | PROJECT PRINCIPAL | The City retained APAI to assist with review and comment on proposed changes to the DO criterion for Oso Bay. TCEQ proposed to make the criterion more stringent by raising it from 4 to 5 mg/L. APAI obtained the data being used by TCEQ and worked closely with the City and TCEQ to determine if another alternative could be found. APAI's review of the data indicated that the criterion should not be made more stringent. TCEQ eventually revised its proposed criterion to 4.5 mg/L. APAI is continuing to work with TCEQ to have the criterion returned to its current level.

Rex Hunt, P.E.

Salinity/Water Quality

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS

EXPERIENCE
25 years

EDUCATION
M.S., Civil Engineering, University of Texas at Arlington

B.S., Civil Engineering, University of Texas at Austin

REGISTRATION
Professional Engineer, Texas #48237

Rex Hunt is an APAI Principal who has gained a wide variety of environmental and civil engineering project experience, including municipal wastewater, industrial wastewater, stormwater management, water resources, and solid waste. In particular, Rex has focused his efforts on regulatory support related to surface water quality issues, stormwater, regional water planning, development and assessment of water supply management strategies, drought planning and management, water reuse, and environmental flows. He has worked closely with regulators, clients and the public throughout his career, participating in numerous public meetings, hearings and presentations. Rex has served the City of Corpus Christi in many capacities over the last 15 years. Rex assisted the Wastewater Department with permit renewals, amendments, and regulatory issues, worked closely with the City's Stormwater and Streets Department to assist with their MS4 permit renewal and stormwater quality data review, assisted the City's Water Utilities Department in diverse areas, such as the Nueces Delta and Pollywog Ponds, assisted the City's Environmental Services Department with negotiating a modified impaired water listing for Corpus Christi Bay, and was the Engineer-of-Record for the original permit for the Cefé Valenzuela Landfill.

A Sampling of Relevant Project Experience

Nueces River Delta Coordination and Rincon Bayou Diversion | City of Corpus Christi | Project Engineer | From 2003 to 2008, APAI assisted the City with coordination with researchers performing a multi-year water, vegetation, and avian monitoring program of the Nueces Delta. The program was funded by the City. Rex's role in the project was to evaluate data, evaluate each year's proposed monitoring programs by the researchers, review reports prepared by the researchers, and assist with implementation of presentations of data and observations by the researchers.

The research was needed because the Nueces Delta receives limited freshwater and tidal inflows as a result of natural and man-induced physical conditions, causing periodic hypersalinity and reduced productivity in this portion of the estuary. Various programs have been implemented in recent years to enhance inflows to the Delta and, thereby, to increase productivity. However, a comprehensive monitoring program was needed to quantify conditions in the Delta and potential benefits of freshwater inflow programs.

Pollywog Pond Permitting | City of Corpus Christi | Project Principal | The City of Corpus Christi retained APAI to assist with permitting for an existing water treatment plant residuals disposal facility known as Pollywog Ponds. These disposal lagoons are the long-term

disposal facility for water treatment plant residuals generated at the O.N. Stevens Water Treatment Plant. The residuals consist of clarifier blow-down and filter backwash from the plant. The City initially needed support with obtaining a permit for the facility. While they had been in use for almost 50 years, the City had never been required to obtain a permit. The project required extensive review of early documentation of the facility and negotiations with TCEQ to finalize the permit.

STORMWATER MAINTENANCE FACILITY DESIGN | PORT OF CORPUS CHRISTI AUTHORITY | PROJECT PRINCIPAL | The project includes low-impact development best management practices, the design of bio-swales, bio-retention planter boxes, and mechanical, engineered stormwater polishing devices at the facility. APAI held a design charrette with representatives with the Port of Corpus Christi to develop design principals and guidelines. From this effort, the type, feel, and location of the bioswales and other low impact development concepts were incorporated into the design. The design is nearing completion with implementation to follow in 2016.

WASTEWATER REGULATORY SUPPORT 2016 | CITY OF CORPUS CHRISTI | PROJECT MANAGER | 2016 regulatory and permitting support project for the City's wastewater treatment facilities. This project includes discharge permitting renewals for three of the City's six plants and revisions of stormwater pollution prevention plans for all six plants. The projects also include on-call regulatory support to assist with routine regulatory issues or enforcement actions, should the City need such assistance.

STORMWATER PERMITTING SUPPORT | CITY OF CORPUS CHRISTI | PROJECT MANAGER, PROJECT ENGINEER AND PROJECT PRINCIPAL | APAI has worked with the City's Stormwater Department since 1999, when the City first retained APAI through its consulting attorney. Regulatory and technical support for stormwater permitting has included assistance with development of the permit application, review and modification of the Stormwater Management Program, statistical analysis of stormwater monitoring data, review of draft permits, and assistance with a minor amendment to remove fecal streptococcus testing requirements from the permit. Rex is currently managing the renewal of the City's MS4 permit.

Ernest To, Ph.D., P.E.

Salinity/Water Quality

ALAN PLUMMER ASSOCIATES, INC.
ENVIRONMENTAL ENGINEERS AND SCIENTISTS

Ernest To's area of specialty is in environmental and water resources engineering. His expertise is in water quality and hydrodynamic modeling, GIS, and environmental software and database development. Ernest has more than 15 years of experience and has managed and worked on many projects.

A Sampling of Relevant Project Experience

Oso Bay Dissolved Oxygen Modeling | City of Corpus Christi | Project Lead | Ernest managed a team of engineers, scientists and researchers to collect site-specific data and to develop a nutrient model that coupled the Fine Resolution Environmental Hydrodynamics Model (FREHD) hydrodynamic code and U.S. Environmental Protection Agency's (EPA) Water Quality Analysis Simulation Program (WASP) 7 to simulate dissolved oxygen in the Bay. The model has been calibrated and demonstrates that existing dissolved water quality standards are not reflective of natural conditions. The model is also used to evaluate the impact of effluent discharge from the Oso Water Reclamation Plant on Oso Bay and to determine permit limits that are protective of Oso Bay. Ernest is assisting the City in discussions with TCEQ regarding appropriate water quality standards for Oso Bay.

San Bernard Jetty Coastal Modeling | Dannenbaum Engineering | Project Manager/Modeler | Project to re-open and stabilize the San Bernard River Estuary. The San Bernard Estuary has been closed off multiple times due to longshore transport of sediment from the Brazos River. The subsequent diversion of San Bernard sediment into the Gulf Intracoastal Waterway (GIWW) has led to sediment accumulation at locks, which affects barge traffic. To re-open the estuary and prevent further mouth closures, he modeled the hydrodynamics of the system to identify areas to excavate a channel to reconnect the river to the Gulf. Velocity outputs from the model were used to develop preliminary designs for channel and Jetty structures. Salinity outputs from the model were used to evaluate impacts on local ecosystem.

Watershed Protection for Texas Reservoirs | Texas Water Development Board | Project Engineer | Ernest assembled the data and tools needed to identify the reservoirs that are most at-risk for sedimentation in Texas. Ernest used EPA's NHDPlus dataset to delineate and characterize watersheds for almost 200 major reservoirs in Texas. Data associated with erosion and sedimentation were extracted from the value-added attribute tables of NHDPlus. These include land use and land cover information (related to watershed erosion), stream length and order (channel erosion), and elevation and precipitation (slope and runoff). The gathered information was compiled into a database

Experience
15 years

Education
Doctorate of Civil Engineering, University of Texas at Austin
M.S., Civil and Environmental, Cornell University
B.S., Civil Engineering, University of Texas at Austin

Registration
Professional Engineer, Texas #110349

to support future reservoir-level studies where sophisticated sediment models will be utilized to develop watershed protection plans.

WATER QUALITY STUDY FOR INTEGRATED PIPELINE PROJECT | TARRANT REGIONAL WATER DISTRICT | PROJECT ENGINEER | Water delivery system designed to run from Lake Palestine in the Neches Basin to reservoirs in the Dallas-Fort Worth Metroplex. The project will provide up to an additional 350 MGD of raw water to North Central Texas to meet future demands and support economic growth. Ernest performed an analysis of reservoir water quality impacts and issues related to discharge of blended water and chemical additives into the receiving reservoirs. Specifically, Ernest constructed a group of steady-state, continuous stirred tank reactor (CSTR) models that stipulated water quality conditions in the receiving reservoirs under projected demand conditions in 2020 and 2030. He also performed nutrient screening using regressions on site-specific chlorophyll-α and total phosphorus data. Finally, he investigated the fate of chemical additives (chloramines and ammonia) in the existing TRWD pipeline to evaluate whether sufficient chemical decay can occur in the integrated pipeline so that water quality standards in the receiving reservoirs are not violated.

CADDO LAKE WATERSHED PROTECTION PLAN | NORTHEAST TEXAS MUNICIPAL WATER DISTRICT | MODELER | Ernest developed a water quality model for Caddo Lake and its tributaries (Big, Little and Black Cypress Creeks) in northeast Texas to simulate its complex wetland habitats and hydrology. The model was used to study the effects of nutrient runoff on the growth of invasive plant species, such as Giant Salvinia and Water Hyacinth in Caddo Lake. The model coupled the TAMU's SWAT model of the Cypress Basin with TCEQ's QUALTX stream model, and EPA's Environmental Fluids Dynamics Code (EFDC) and WASP lake models. Results were used to support watershed protection and implement best management practices in the Cypress basin.

WATER QUALITY STUDY OF THE LOWER COLORADO RIVER | LOWER COLORADO RIVER AUTHORITY | PROJECT ENGINEER | Ernest supported the development of a QUALTX water quality model to evaluate potential dissolved oxygen impacts by the LCRA-SAWS interbasin transfer project. He was responsible for generating the model grid, computing flow rating curves for the segments, pre- and post-processing model inputs and outputs; and performing field sampling at critical locations along the river.

LUCE BAYOU INTERBASIN TRANSFER PROJECT | AECOM | LEAD MODELER | Study to investigate the impact of transferring 400 MGD of Trinity River water into Lake Houston via the proposed Luce Bayou canal. Ernest estimated nutrient loadings from the seven creeks in the San Jacinto Basin using USGS' LOADEST tool. He built hydrodynamic and water quality models on Lake Houston using EPA's EFDC and WASP programs. The models were calibrated and then used to simulate changes in water circulation, nutrient and dissolved oxygen.

Bradley Hamer

Report Preparation

AmaTerra ENVIRONMENTAL, INC.

EXPERIENCE
24 years

EDUCATION
B.A., Environmental Science, 2nd major in Biochemistry, Rice University

Brad manages and provides oversight for all projects related to hazardous waste and site investigations. He has over 24 years of experience in the area of hazardous waste site investigations, human health risk assessments, RCRA Facility Investigations (RFIs), development of work plans and closure plans, hydrogeological investigations, and Quality Assurance/ Quality Control.

In addition to his experience in the area of hazardous waste management, he has performed and managed numerous projects in the area of natural resources management, including NEPA Environmental Assessments and Categorical Exclusions, water quality studies, biological evaluations, and wildlife surveys. Brad has been performing projects for the USACE- Ft. Worth District for over 12 years.

A SAMPLING OF RELEVANT PROJECT EXPERIENCE

DUE DILIGENCE AUDITS - PHASE I AND PHASE II, ENVIRONMENTAL SITE ASSESSMENTS | VARIOUS CLIENTS AND LOCATIONS | ENVIRONMENTAL SCIENTIST | Brad has been performing Phase I and Phase II ESA's since 1997 and has conducted over 150 to date. He conducted an Environmental Baseline Survey (equivalent to a Phase I ESA) of 5% of family housing units plus two industrial areas, a retail store, four undeveloped areas, and a golf course at Fort Hood, Texas. He also performed and/or wrote reports of Phase I ESA projects addressing 61 cable headend sites in four states, an additional 11 headend sites in two states, and 13 commercial nurseries. Additional projects include the management and preparation of Phase I ESAs ranging from unimproved land to complex industrial facilities located throughout Texas.

PHASE II SITE INVESTIGATION AT HELICOPTER ACCIDENT SITES | FALCON STATE PARK, TEXAS | ENVIRONMENTAL SCIENTIST | Brad conducted a site investigation on an emergency basis on behalf of Joint Task Force Six (JTF-6; now JTF-North) and the USACE- Ft Worth District following the collision of two helicopters in a state park in South Texas. He performed soil sampling for the presence of petroleum hydrocarbons at the two crash sites using a specialized method developed by the State of Texas. His report on the findings of the investigation presented a rationale for natural attenuation as an acceptable remedial action was accepted by the Texas Parks and Wildlife Department, resulting in significant cost savings for JTF-6. At the conclusion of this project, Brad received a letter from the Commanding Officer of JTF-6 thanking him for his timely performance

RISK ASSESSMENTS | VARIOUS CLIENTS AND LOCATIONS | ENVIRONMENTAL SCIENTIST | Brad performed the Risk Assessment (RA) for the Remedial Investigation/Feasibility Study of the Hagerson Road State Superfund Site, Texas, at which the contaminants of concern were lead and

Total Petroleum Hydrocarbons (TPH) He used an innovative approach developed by the State of Massachusetts, which has since been adopted by the TNRCC, to evaluate TPH risks based on Tentatively Identified Compounds in the absence of detected volatile and semivolatile organics. Other RAs Brad has performed addressed the potential resuspension of chlorinated solvents resulting from dredging of contaminated sediment at a ship-loading dock of a large chemical manufacturing complex, the dredging and disposal of river sediment containing polynuclear aromatic hydrocarbons (PAHs), and gasoline products in the subsurface environment as part of the conversion of the site of a former service station to a fast-food restaurant.

HAZARDOUS WASTE SITE INVESTIGATIONS | VARIOUS CLIENTS AND LOCATIONS | ENVIRONMENTAL SCIENTIST | Brad managed the groundwater monitoring program at a Leaking Underground Storage Tank site for an agricultural products facility in North Texas, including performance of quarterly sampling, preparation of quarterly sampling reports, and serving as liaison between the plant manager and the Texas Natural Resource Conservation Commission (TNRCC). Additional projects include RCRA Facility Investigations (RFIs) at large chemical manufacturing complexes in Oklahoma and Texas; quarterly groundwater sampling of monitoring well networks at two landfarms and an equalization basin at a petroleum refinery in Texas; soil and sediment sampling at a mercaptan- and amine-products manufacturer in Texas; and sampling of drums of unknown contents, sludge from a floor drain system, contents of tanks containing asphaltic product, scrap metal (wipe samples), concrete rubble, and floating solid material from a wastewater pond at various industrial facilities.

QUALITY ASSURANCE/QUALITY CONTROL | VARIOUS CLIENTS AND LOCATIONS | Brad prepared Site-Specific Chemical Quality Assurance Project Plans (QAPPs) for the $25MM remediation of five landfills, two drainage channels, a subsurface jet fuel plume, two tanks containing an asphaltic product, and miscellaneous excavations at Bergstom AFB. He ensured compliance with the QAPPs by supervising and/or performing all related investigation, waste characterization, and confirmation sampling, managing all documentation and analytical data, and performing data evaluation and validation on all laboratory data. Additional projects include evaluation and validation of all analytical data generated during the installation of 125 monitoring wells at Tinker AFB, Oklahoma, while serving as QA/QC Officer for the project; preparation of QAPPs and data evaluation and validation on all analytical results for the RIs of the Butler Ranch and Hagerson Road State Superfund Sites in Texas; and preparation of a QAPP for a project involving removal of underground storage tank at Tinker AFB.

Victor Palma

Report Preparation

EXPERIENCE

35 years

EDUCATION

M.S., Aquatic Biology, Texas State University

B.S., Biology (with Honors) Texas State University

Victor Palma is the Vice President of AmaTerra Environmental, Inc. He brings over 35 years of experience in the environmental field, with over 28 years serving in Senior/Executive Management positions. He has overseen five multi-year Statewide or Evergreen Texas Department of Transportation (TxDOT) contracts that included numerous concurrent projects at multiple locations. He has also overseen Federal multi-million dollar, ID/IQ contracts involving multiple concurrent projects with the USACE – Ft. Worth District's Piney Woods Office, Fort Hood and Fort Bliss. He has served as the Project Manager, Senior Biologist, and primary author on numerous environmental studies and NEPA documents, including Environmental Assessments, Categorical Exclusions, Environmental Information Documents, Environmental Site Assessments, and portions of Environmental Impact Statements.

Victor has an extensive background in simultaneously managing large and small numbers of multi-disciplined staff, coordinating more than 50 concurrent projects for a variety of clients at multiple locations, while maintaining schedules, budget and quality of the final product.

Significantly, Victor possesses an extraordinary blend of relevant experience that includes both the public and private environmental sectors. With nearly 11 years of regulatory agency experience, including tenures with the U.S. Fish and Wildlife Service (USFWS), the Texas Parks and Wildlife Department (TPWD), the Texas Department of Agriculture (TDA), and the Lower Colorado River Authority (LCRA); and 24 years in private consulting, Victor not only excels at identifying potential impacts to environmental resources, but is well-versed in regulatory and compliance issues.

A SAMPLING OF RELEVANT PROJECT EXPERIENCE

NEPA ENVIRONMENTAL ASSESSMENT (EA) OF AN URBAN ASSAULT COURSE | FORT HOOD, TEXAS | PROJECT MANAGER AND PRIMARY AUTHOR | NEPA EA for a proposed major construction effort within the restricted live-fire area on Fort Hood, Texas. Specifically the EA addressed the construction of a proposed Urban Assault Course (UAC), Shoot House, and associated support facilities for the U.S. Department of the Army, Headquarters III Corps, and Fort Hood. The EA addressed a number of concerns, including: threatened and endangered bird species, wetlands, an adjacent creek, grasslands, cultural resources, and socio-economic issues.

BIOLOGICAL SURVEY OF 13 THREATENED AND ENDANGERED PLANTS AND ANIMALS | USACE AND FORT BLISS, MCGREGOR GUIDED MISSILE RANGE, NEW MEXICO | PROJECT MANAGER | Biological habitat and population survey that included Sneeds pincushion cactus, Alamo beardtongue, Desert star cactus, Hueco rock-daisy, sand prickly pear, bald eagle,

mountain plover, Arizona prairie dog, Baird's sparrow, ferruginous hawk, burrowing owl, Texas horned lizard, and northern aplamado falcon. In addition to project oversight, Victor participated in bald eagle and northern aplamado falcon surveys.

BIOLOGICAL SURVEY OF 5 THREATENED AND ENDANGERED BIRD SPECIES | USACE AND FORT BLISS, MCGREGOR GUIDED MISSILE RANGE, NEW MEXICO | PROJECT MANAGER | Habitat and population survey, which included second-year funding to continue surveys of bald eagle, northern aplamado falcon, Baird's sparrow, and ferruginous hawk, and new surveys of Mexican spotted owl at Fort Bliss and McGregor Range. In addition to project oversight, Victor participated in bald eagle surveys.

ENDANGERED SPECIES HABITAT IMPACT/DAMAGE ASSESSMENT, INTERNATIONAL BOUNDARY AND WATER COMMISSION, FALCON RESERVOIR, TEXAS | QA/QC OFFICER | Damage assessment following the clearing of thick brush favored by the endangered ocelot and jaguarondi by a field crew laying seismic lines for natural gas exploration.

WATER QUALITY/BIOLOGICAL STUDY: TOTAL MAXIMUM DAILY LOADS (TMDL) FOR 32 SITES IN 11 STREAM SEGMENTS IN FOUR RIVER BASINS IN CENTRAL AND SOUTH TEXAS | PROJECT MANAGER | 5-year TMDL study within the Nueces, Colorado, San Antonio, and Atascosa River Basins in Central and South Texas. He oversaw all aspects of biological analyses (including field sampling of fish and macro invertebrates, Index of Biotic Integrity calculations, habitat assessment evaluations, and database development and reporting). Additionally, Victor was in charge of all Public Participation process tasks for this project, including serving as the Project's Public Information Officer on behalf of the Texas Commission on Environmental Quality (TCEQ), developing and ensuring the publication of all project-related public notices and press releases; mailing, phoning, and e-mailing constituents; developing public information bulletins for the TCEQ website; arranging sites for public meetings; coordinating/hosting/conducting all public meetings; and preparing meeting minutes and follow-up reports. One unique component of the Public Participation process within the Atascosa River Basin and Sandies and Elm Creek watersheds was the development of two public steering committees to work with and provide input to TCEQ decisions regarding local water quality regulations.

Stephen Stecher, P.E.

Salinity/Water Quality

Stephen Stecher, P.E., President of Crespo Consulting Services, directs a locally-owned and operated civil and environmental engineering firm in Austin. He has over 29 years of project management and 35 years of engineering experience in civil engineering related to hydrologic, hydraulic and water quality studies and design. He has direct project experience involving drainage, flooding, water quality and erosion control in the Austin area. Stephen has performed or directed numerous engineering projects including street, drainage and utility design; Storm Water Pollution Protection Plans (SW3P); channel improvements for flood and erosion control; design and permitting of innovative water quality facilities and flood management projects; design of regional detention facilities and park improvements; preparation and updating of watershed master plans; hydrologic and hydraulic modeling; water availability modeling; revising and updating of FEMA maps; and use and analysis of GIS for watershed planning and engineering. Stephen has been involved in and managed many environmental engineering and consulting projects including: environmental site assessments; environmental constraints evaluations; pollution control and BMP designs; landfill studies and permitting compliance reviews; and environmental commissioning for the City of Austin.

A Sampling of Relevant Project Experience

Texas River Basins Water Availability Modeling | Various Locations Across Texas | Project Manager | Performed subconsultant work for a number of TCEQ Water Availability Modeling (WAM) projects for the following river basins: Trinity, Sabine, Neches, Colorado, Canadian, Red, Sulphur, Brazos, Guadalupe, San Antonio, Nueces and Rio Grande. The watershed modeling work included utilization of GIS to develop watershed runoff parameters, locations of wastewater discharges, water rights and reservoirs. Estimated future water usage and wastewater flows based on population projections. Performed reservoir volume analyses for existing and future conditions, including estimation of current and historical watershed sediment load. Developed rainfall, runoff and evaporation characteristics throughout the basins and simulated reservoir inflow, discharge and content.

Water Resource Planning Study | City of Austin | Project Manager | Provided engineering services to identify and evaluate surface water supply alternatives for inclusion into the Integrated Water Resources Plan for the City of Austin. Performed a water availability modeling (WAM) analysis using the WRAP model and a water rights permitting analysis to develop technically sound and environmentally feasible surface water alternatives for the City. Analysis included the use of existing and future surface water reservoirs and modeling of potential impacts. Hydrologic

Crespo Consulting Services, Inc.
Civil & Environmental Engineering

Experience
35 years

Education
M.S. Civil Engineering, University of Texas at Austin

B.S. Civil Engineering with Highest Honors, University of Texas at Austin

Registration
Professional Engineer, Texas #55645

data and WAM models for the appropriate tributaries of the Colorado River and adjacent River Basins were gathered along with information on State water supply planning for Region K in order to evaluate further alternatives. Groundwater, water re-use and aquifer storage and retrieval were also evaluated.

TEXAS COASTAL BASIN WATER AVAILABILITY MODELING STUDY | VARIOUS LOCATIONS ACROSS TEXAS | PROJECT MANAGER | Performed subconsultant work on the TCEQ WAM project for the all the Texas coastal basins. The watershed modeling work included utilization of ArcView GIS to develop watershed runoff parameters and stream characteristics. Implemented SWAT and other NRCS models using GIS. The models were calibrated to nearby gages with similar soils and geologic conditions. Runoff modeling techniques were adapted for the sandy, dry soils of the area. With GIS input, used the model to simulate naturalized flows for the ungaged watersheds and verified the locations of diversions and wastewater treatment plants, and determined the upstream intervening drainage area to each control point. Developed runoff and evaporation characteristics for reservoirs and estimated reservoir content for small in-channel reservoirs.

WATER TREATMENT PLANT 4 ENVIRONMENTAL COMMISSIONING | CITY OF AUSTIN | WATER QUALITY TASK LEADER | Performing independent research on facility component designs and providing evaluations of water quality detention and environmental facilities and controls. Work will include review of environmental mitigation measures, Best Management Practices, and adaptive strategies proposed by the WTP4 design team, as well as analyses to establish a threshold concentration of potential contaminants and perform environmental impact analyses to identify contaminant discharges.

AUSTIN BERGSTROM INTERNATIONAL AIRPORT STORMWATER MASTER PLAN UPDATE | CITY OF ASUTIN | TASK MANAGER | Currently engineering services and technical evaluation of water quality condition at the airport as part of the Stormwater Master Plan Update. Reviewed existing ABIA Water Quality TPDES Data and current City of Austin Water Quality Ordinances applicable to the airport.

BARTON HILLS RETROFIT | CITY OF AUSTIN | PROJECT MANAGER | Designed water quality controls in COA parkland to reduce pollutants reaching Barton Creek and Barton Springs including ponds, trails and sidewalks, channel stabilization, inlets, and pipes. Directed the development of a WPAP and corresponding geologic assessment to comply with TCEQ requirements. Directed and performed the final project design which included erosion control measures, a sedimentation/infiltration pond, storm sewers and inlets, channel revegetation, tree mitigation and planting plan, and parkland aesthetics.

Item 4: HUB Subcontracting Plan

The Historically Underutilized Businesses (HUB) Subcontracting Plan is included in a separate envelope as requested in the RFQ.

ITEM 5: OWNERSHIP OF BUSINESS ENTITY

FNI has no owners with at least 25 percent ownership.

Exhibit B
Scope of Work

Explore and Evaluate Alternative Methods to Increase Freshwater to the Nueces Delta

For many years, the Nueces Delta has suffered from limited freshwater inflow and sediment loading. As result, large areas of the delta are hypersaline for much of the time, negatively impacting delta vegetation, habitat and wildlife. Limited sediment loading may have allowed increased erosion rates of the delta face and open water areas within the delta near the delta shore to expand.

Numerous entities and agencies have worked for decades to find ways to provide adequate freshwater and sediments to the delta and slow its decline, including the Nueces Estuary Advisory Council, Nueces Basin and Bay Area Stakeholder Committee, Coastal Bend Bay and Estuary Program, marine science researchers from the Coastal Bend area, Bureau of Reclamation, City of Corpus Christi, Texas Parks and Wildlife Department (TPWD), Texas Commission on Environmental Quality (TCEQ) and Texas Water Development Board (TWDB). Programs such as the Rincon Bayou cut, the Rincon Bayou Pump Station, and the Allison Effluent Diversion Demonstration Project have helped to reduce salinity in limited parts of the delta, but greater inflows could help further.

The scope of work for this project will identify alternatives to provide freshwater to the Nueces Delta and evaluate the feasibility of those alternatives. The evaluation will include identifying and investigating issues associated with the physical and logistical aspects of diverting water from the river, potential effects on the river, and permitting and regulatory issues or requirements. The objective would be to identify selected alternatives that could improve the ecological health of the Nueces Delta, Nueces Bay and the Nueces River tidal.

This project is envisioned as the first phase in obtaining additional flows and restoring the Nueces Delta ecosystem and will focus on these following potential strategies:

- Modification of the Rincon Bayou Pipeline permit to pump water from the Nueces River into the South Lake area of the Nueces Delta,
- Addressing regulatory obstacles to cost-effectively modify the City of Corpus Christi's Allison Wastewater Treatment Plant permit to allow discharge of treated effluent to the Nueces Delta,
- Increasing the volume of Nueces River water that can be pumped into Rincon Bayou from the existing pump station, and
- Shifting wastewater treatment plant return flows from the Oso Creek/Oso Bay watershed into Rincon Bayou.

FNI will complete the following tasks under this scope of work:

Task 1: Inflow Strategy Identification

1. Explore the above-identified potential strategies with key members of the Nueces Estuary Advisory Council, Nueces Basin and Bay Area Stakeholder Committee, Coastal Bend Bay and Estuary Program, Bureau of Reclamation, City of Corpus Christi, TPWD, TCEQ and TWDB who regularly work on the issue of freshwater inflows to the delta. We will also interview key researchers such as Dr. Ken Dunton, UTMSI, Dr. Paul Montagna, Harte Research Institute, Dr. Ben Hodges, University of Texas at Austin, and Brian Nicolau, Center for Coastal Studies, who have worked for decades in the delta.
2. Attend 4 meetings with subcontractors and stakeholders as part of this task. Two meetings will take place in Corpus Christi with stakeholders and two meetings will be attended in Austin with subcontractors.
3. Review literature sources for strategies that may have been implemented in other estuarine areas of the nation or world.

Task 2: Report Preparation

1. Prepare a report that includes the following information for each alternative identified:

    a. Source of water (location, owner, etc.)
    b. Amount of water that could be provided
    c. When water could be provided (frequency, season)
    d. Location of source
    e. Potential point(s) of addition to the delta
    f. Conceptual opinions of cost of obtaining the source of water
    g. Conceptual opinions of cost of providing the water to the delta
    h. Potential physical, chemical, biological effects of removing the water from the source
    i. Potential physical, chemical, biological effects of adding water to the delta
    j. Permits required to provide the additional water to the delta, and
    k. Time required to complete requirements (permitting, infrastructure completion).

    The report should be considered a dynamic document that can be easily updated with new information as it becomes available. It is not expected there will be adequate time and resources to provide detailed information that has been researched in-depth for each category for each strategy in the report. Sources of information will be cited with estimated levels of confidence.

    The draft report will be provided to the TWDB by the Study Completion Date and with TWDB approval, will be provided to the entities listed in Step No.1 of Task 1 above. Comments must be addressed in the Final Report and a copy of the comments will be incorporated into the final deliverables.

The final report with revisions as requested by TWDB will be submitted to the TWDB within 30 days of receiving TWDB comments and prior to Contract Expiration Date. The final report will be accompanied by a transmittal letter. Draft and final reports will be delivered in Microsoft Word and PDF formats.

Task 3: Project Management

1. Monthly Progress Reports will be provided to the TWDB and offered to the Nueces Estuary Advisory Council, Nueces Basin and Bay Area Stakeholder Committee, Coastal Bend Bay and Estuary Program, City of Corpus Christi, TPWD, and TCEQ, no more than 30 days following each State fiscal quarter after Notice to Proceed is issued.

EXHIBIT C

TASK AND EXPENSE BUDGETS

TASK BUDGET

TASK	DESCRIPTION	TWDB AMOUNT
TASK 1	Inflow Strategy Identification	$29,300.00
TASK 2	Report Preparation	19,000.00
TASK 3	Project Management	1,700.00
Total		**$50,000.00**

EXPENSE BUDGET

CATEGORY	TWDB AMOUNT
Salaries and Wages[1]	$20,700.00
Fringe[2]	0.00
Travel[3]	1,300.00
Other Expenses[4]	0.00
Subcontract Expenses	28,000.00
Overhead[5]	0.00
Profit	0.00
TOTAL	**$50,000.00**

[1] Salaries and Wages is defined as the cost of salaries of engineers, draftsmen, stenographers, surveymen, clerks, laborers, etc., for time directly chargeable to this CONTRACT.
[2] Fringe is defined as the cost of social security contributions, unemployment, excise, and payroll taxes, workers' compensation insurance, retirement benefits, medical and insurance benefits, sick leave, vacation, and holiday pay applicable thereto.
[3] Travel is limited to the maximum amounts authorized for state employees by the General Appropriations Act, Tex. Leg. Regular Session, 2015, Article IX, Part 5, as amended or superseded
[4] Other Expenses is defined to include expendable supplies, communications, reproduction, postage, and costs of public meetings directly chargeable to this CONTRACT.
[5] Overhead is defined as the costs incurred in maintaining a place of business and performing professional services similar to those specified in this CONTRACT.

EXHIBIT D

GUIDELINES FOR AUTHORS SUBMITTING CONTRACT REPORTS TO THE TEXAS WATER DEVELOPMENT BOARD

1.0 Introduction

The purpose of this document is to describe the required format of contract reports submitted to the Texas Water Development Board (TWDB). Our reason for standardizing the format of contract reports is to provide our customers a consistent, and therefore familiar, format for contract reports (which we post online for public access). Another reason for standardizing the format is so that we can more easily turn a contract report into a TWDB numbered report if we so choose. Remember that your report will not only be seen by TWDB staff, but also by any person interested in the results of your study. A professional and high quality report will reflect well on you, your employer, and the TWDB.

Available upon request, we will provide a Microsoft Word template (used to write these instructions) that gives the fonts, spacing, and other specifications for the headings and text of the report. Please follow this template as closely as possible.

2.0 Formatting your report

The TWDB format is designed for simplicity. For example, we use Times New Roman for all text. We use 12 point, single-spaced text, left justification for paragraph text, 18 point bold for first-level headings, and 14 point bold for second-level headings. Page numbers are centered at the bottom of the page. Other than page numbers, please refrain from adding content to the document header or footer. Page setup should use one-inch margins on all four sides.

2.1 Text

The best way to format your document is to use the styles described and embedded in the template document (Authors_Template.dot) that is available on request from the TWDB. To use the Authors_Template.dot file, open it in Word (make sure *.dot is listed under Files of type) and save it as a .doc file. Advanced users can add the .dot file to their computers as a template. Make sure the formatting bar is on the desktop (to open, go to View→Toolbars→Formatting) or, to view all of the formatting at once, go to Format→Styles and Formatting and select Available Styles from the dropdown box at the bottom of the window. The formatting in the template document provides styles (such as font type, spacing, and indents) for each piece of your report. Each style is Freese and Nichols, Inc.d to describe what it should be used for (for example, style Freese and Nichols, Inc.s include Chapter Title, Body Text, Heading 1, References, and Figure or Table Caption). As you add to your report, use the dropdown list on the Formatting Toolbar or the list in the Styles and Formatting window to adjust the text to the correct style. The Authors_Template.dot file shows and lists the specifications for each style.

2.1.1 Title

Give your report a title that gives the reader an idea of the topic of your report but is not terribly long. In addition to the general subject (for example, “Droughts”), you may include a few additional words to describe a place, methodology, or other detail focused on throughout the paper (for example, “Droughts in the High Plains of Texas” or “Evaluating the effects of drought using groundwater flow modeling”). Please capitalize only the first letter of each word except ‘minor’ words such as ‘and’ and ‘of’. Never use all caps.

Use headings to help the reader follow you through the main sections of your report and to make it easier for readers to skim through your report to find sections that might be the most interesting or useful to them. The text of the report should include an executive summary and sections outlined in 4.4 of Attachment 1. Headings for up to five levels of subdivision are provided in the template; however, we suggest not using more than three or four levels of subdivision except where absolutely necessary. Please avoid stacked headings (for example, a Heading 1 followed immediately by a Heading 2), and capitalize only the first letter of headings or words where appropriate—never use all caps.

2.2 Figures and photographs

To publish professional-looking graphics, **we need all originals to be saved at 300 dots-per-inch** (dpi) and in grayscale, if possible, or in the CMYK color format if color is necessary. Excessive use of color, especially color graphics that do not also work in grayscale, will prevent us from publishing your report as a TWDB numbered report (color reproduction costs can be prohibitive). Preferred file formats for your original graphics are Adobe Illustrator (.ai), Photoshop (.psd), EPS with .tiff preview, .jpg, .png, or .tiff files. Refrain from using low resolution .jpg or .gif files. Internet images at 72 dpi are unacceptable for use in reports.

All graphics shall be submitted in two forms:

1. Inserted into the Microsoft Word document before you submit your report. Ideally, inserted graphics should be centered on the page. Format the picture to downsize to 6 inches wide if necessary. Please do not upsize a graphic in Word.
2. Saved in one of the formats listed above.

2.2.1 Other graphics specifications

It is easiest to design your figures separately and add them in after the text of your report is more or less complete. Graphics should remain within the 1-inch page margins of the template (6.5 inches maximum graphic width). Be sure that the graphics (as well as tables) are numbered in the same order that they are mentioned in the text. Figures should appear embedded in the report after being called out in the text. Also, remember to include a caption for each graphic in Word, not as part of the graphic. We are not able to edit or format figure captions that are part of the figure. For figures and photographs, the caption should appear below the graphic. For tables, the caption should appear above.

2.2.2 Creating publication-quality graphics

When designing a graphic, make sure that the graphic (1) emphasizes the important information and does not show unnecessary data, lines, or labels; (2) includes the needed support material for the reader to understand what you are showing; and (3) is readable (see Figures 1 and 2 for examples). Edward R. Tufte's books on presenting information (Tufte, 1983; 1990; 1997) are great references on good graphic design. Figures 1 through 3 are examples of properly formatted, easy to understand graphics. Do not include fonts that are less than 6 points.

For good-looking graphics, the resolution needs to be high enough to provide a clear image at the size you make them within the report. In general, 300 dpi will make a clear image—200 dpi is a minimum. Try to create your figures at the same size they will be in the report, as resizing them in Word greatly reduces image quality. Photographs taken with at least a two-megapixel camera (if using digital) and with good contrast will make the best images. Save the original, and then adjust color levels and size in a reFreese and Nichols, Inc.d image copy. Print a draft copy of your report to double-check that your figures and photographs have clear lines and show all the features that you want them to have.

Figures and photographs should be in grayscale. Color greatly adds to the cost of printing, so we are trying to keep it to a minimum. Also remember that your report may be photocopied, scanned, or downloaded and printed in black and white. For this reason, you should use symbols or patterns, or make sure that colors print as different shades in black and white. All interval or ratio data (data measuring continuous phenomena, with each color representing an equal interval) need to be displayed in a graded scale of a single color (Figure 3). This way your figures will be useful even as a photocopy.

If you need help with your graphics or have questions, please contact the TWDB graphics department at (512) 936-0129.

2.2.3 Using other people's graphics

Figures and photographs (and tables) need to be your own unless you have written permission from the publisher that allows us to reprint them (we will need a copy of this permission for our records). Avoid using any figures or photographs taken off the Internet or from newspapers or magazines—these sources are difficult to cite, and it is often time-consuming and expensive to gain permission to reproduce them.

2.3 Tables

Tables should be created in Microsoft Word (see Table 1). Tables should include a minimal amount of outlining or bold font to emphasize headings, totals, or other important points. Tables should be numbered separately from figures, and captions should appear above the text of the table.

Table 1: A sample table. Note caption above table.

Table text heading*

Table text	1940	1950	1960	1970	1980	1990	2000	%GW
Table text	15	441	340	926	196	522	83	97.4
Table text	64	944	626	173	356	171	516	99.9
Total	79	1385	966	1099	552	693	599	

* A footnote should look like this using 10 point Times New Roman.
%GW = percent groundwater
Be sure to describe any abbreviations or symbols, and, unlike in this table, be sure to note the units!

3.0 Units

Measurements should be in English units. Metric units may be included in parentheses after the English units.

All units of geologic time should conform to the most recent geologic timescale (Gradstein and others, 2004). A summary of this timescale is available from the International Commission on Stratigraphy's website at http://stratigraphy.org/chus.pdf.

4.0 Citations and references

It is important to give credit where credit is due. Therefore, be sure to use the appropriate citations and include references in your paper.

4.1 In-text citations

Each piece of information you use in your report that comes from an outside source must be cited within the text using the author's last Freese and Nichols, Inc. and the year of publication. If there are two

authors, list the last Freese and Nichols, Inc. of each followed by the year, and if there are more than two authors, list the last Freese and Nichols, Inc. of the first author followed by "and others" and the year. For example: the end of the Jurassic Period occurred approximately 145.5 million years ago (Gradstein and others, 2004).

4.2 References

All sources that are cited within the report should be listed at the end of the paper under the heading References. The references should follow the guidelines in "Suggestions to Authors of the Reports of the United States Geological Survey" (Hansen, 1991). These are available online at http://www.nwrc.usgs.gov/lib/lib_sta.html (a link to the chapter "Preparing references for Survey reports," p. 234-241, is found here). Several examples of complete reference citations are listed at the end of these guidelines. Be sure that any citations that appear in tables or figures are included in the reference list. Also, before submitting the report, please check that all the citations in the report are included in the reference list and all references in the reference list are cited in the report. If at all possible, avoid web-based citations. These materials are often transient and therefore useless to future readers.

5.0 Submitting your report

Before you submit your report, proofread it. Look for spelling and grammatical errors. Also, check to see that you have structured the headings, paragraphs, and sentences in your paper so that it is easy to follow and understand (imagine you are a reader who does not already know the information you are presenting!).

6.0 Conclusions

Following the instructions above and providing accurate and readable text, tables, figures, and citations will help to make your report useful to readers. Scientists may read your report, as well as water planners, utility providers, and interested citizens. If your report successfully conveys accurate scientific information and explanations to these readers, we can help to create more informed decisions about the use, development, and management of water in the state.

7.0 Acknowledgments

Be sure to acknowledge the people and entities that assisted you in your study and report. For example: We would like to thank the Keck Geology Consortium, the American Society of Civil Engineers, and the Texas Bar CLE for providing examples to use in developing these guidelines. In addition, we appreciate Mike Parcher for providing information on how to create publication-quality graphics, Shirley Wade for creating the data used in sample Figure 1, and Ian Jones for providing sample Figure 3.

8.0 References

Gradstein, F.M., J.G. Ogg, and A.G. Smith, eds., 2005, A geologic time scale 2004: Cambridge, Cambridge University Press, 610 p.

Hansen, W.R., ed., 1991, Suggestions to authors of the reports of the United States Geological Survey (7th ed.): Washington, D.C., U.S. Government Printing Office, 289 p.

Tufte, E. R., 1983, The visual display of quantitative information: Cheshire, C.T., Graphics Press, 197 p.

Tufte, E. R., 1990, Envisioning information: Cheshire, C.T., Graphics Press, 126 p.

Tufte, E. R., 1997, Visual explanations: Cheshire, C.T., Graphics Press, 156 p.

9.0 Examples of references

Arroyo, J. A., and Mullican, III, W. F., 2004, Desalination: *in* Mace, R. E., Angle, E. S., and Mullican, W. F., III, editors, Aquifers of the Edwards Plateau: Texas Water Development Board Report 360, p. 293-302.

Bates, R. L., and Jackson, J. A., 1984, Dictionary of geological terms: Anchor Press/Doubleday, Garden City, New York, 571 p.

Blandford, T. N., Blazer, D. J., Calhoun, K. C., Dutton, A. R., Naing, T., Reedy, R. C., and Scanlon, B. R., 2003, Groundwater availability of the southern Ogallala aquifer in Texas and New Mexico–Numerical simulations through 2050: contract report by Daniel B. Stephens and Associates, Inc., and the Bureau of Economic Geology, The University of Texas at Austin to the Texas Water Development Board, variably paginated.

Fenneman, N. M., 1931, Physiography of Western United States (1st edition): New York, McGraw-Hill, 534 p.

Hubert, M., 1999, Senate Bill 1–The first big bold step toward meeting Texas's future water needs: Texas Tech Law Review, v. 30, no. 1, p. 53-70.

Kunianski, E. L., 1989, Precipitation, streamflow, and baseflow in West-Central Texas, December 1974 through March 1977: U. S. Geological Survey Water-Resources Investigations Report 89-4208, 2 sheets.

Mace, R. E., Chowdhury, A. H., Anaya, R., and Way, S.-C., 2000, A numerical groundwater flow model of the Upper and Middle Trinity aquifer, Hill Country area: Texas Water Development Board Open File Report 00-02, 62 p.

Maclay, R. W., and Land, L. F., 1988, Simulation of flow in the Edwards aquifer, San Antonio Region, Texas, and refinements of storage and flow concepts: U. S. Geological Survey Water-Supply Paper 2336, 48 p.

For more examples of references, see p. 239-241 of "Suggestions to Authors of the Reports of the United States Geological Survey" at http://www.nwrc.usgs.gov/lib/lib_sta.html.

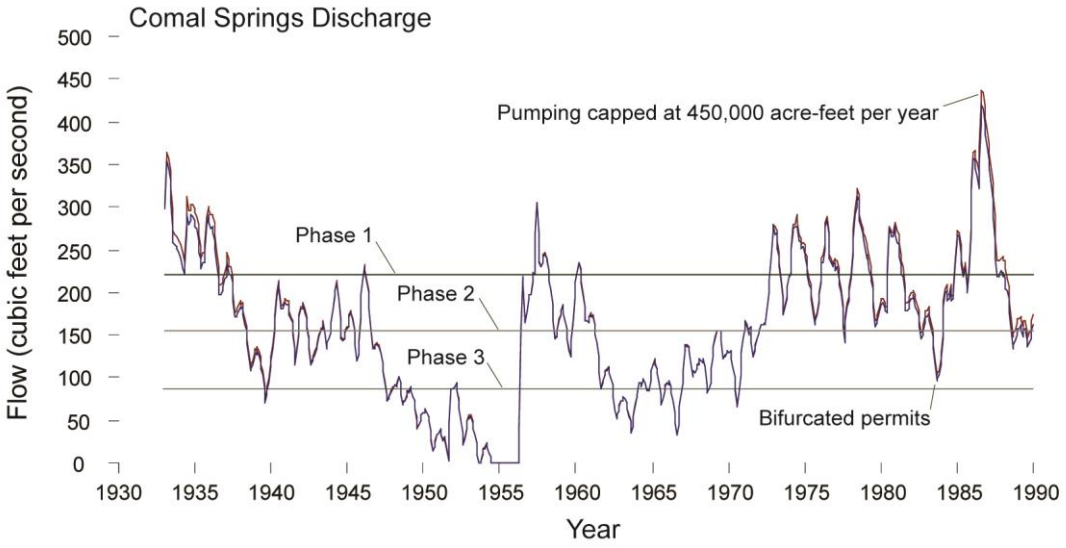

Figure 1. A sample figure showing only the information needed to help the reader understand the data. Font size for figure callouts or labels should never be less than 6 point.

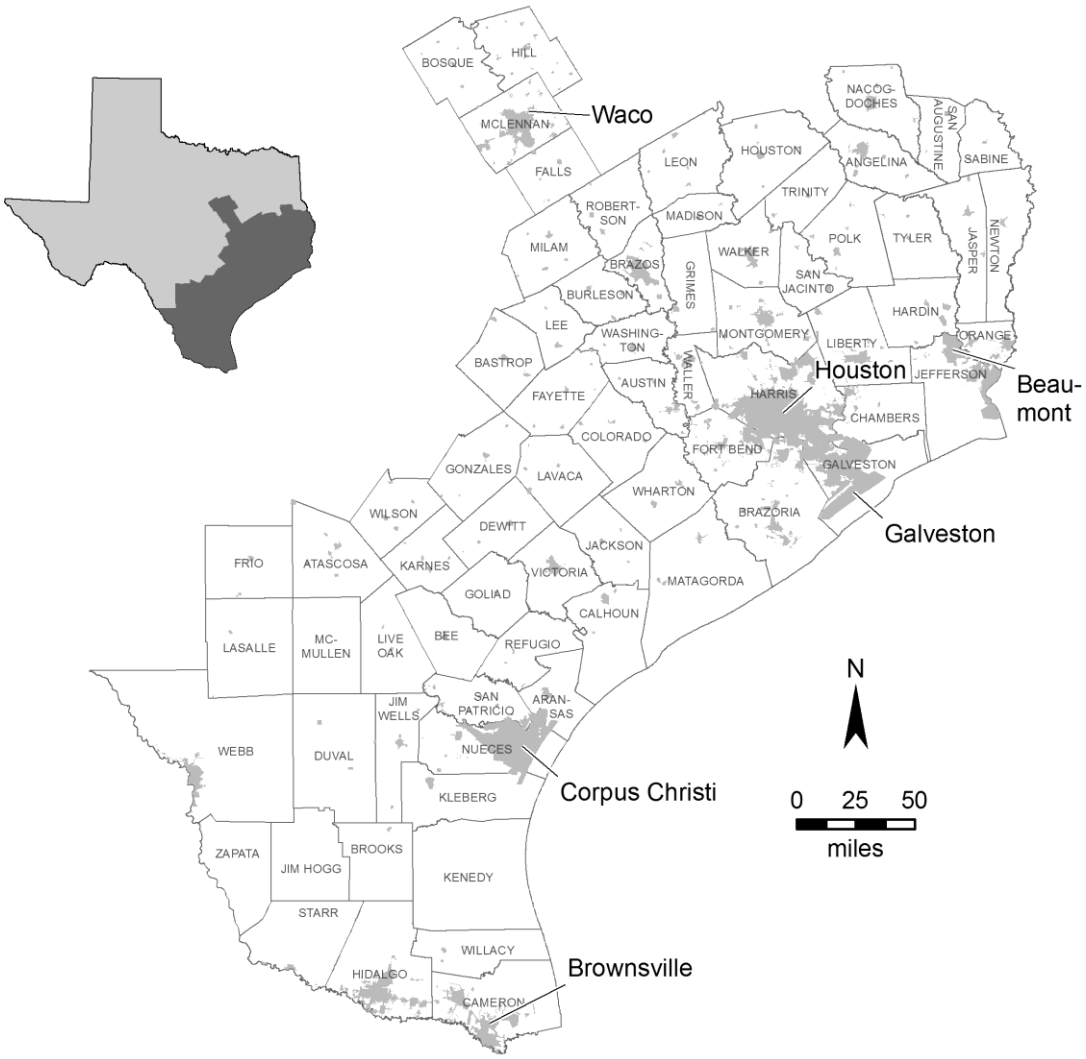

Figure 2. A sample subject area map, giving the reader enough information to understand the location being discussed in this conference. For map figures, be sure to include a north arrow to orient the reader, a scale, and, if needed, a submap that places the figure in greater geographic context. Be sure that text is readable and that any citations listed on the figure or in the figure caption are included in the reference list. Font size should never be less than 6 pt.

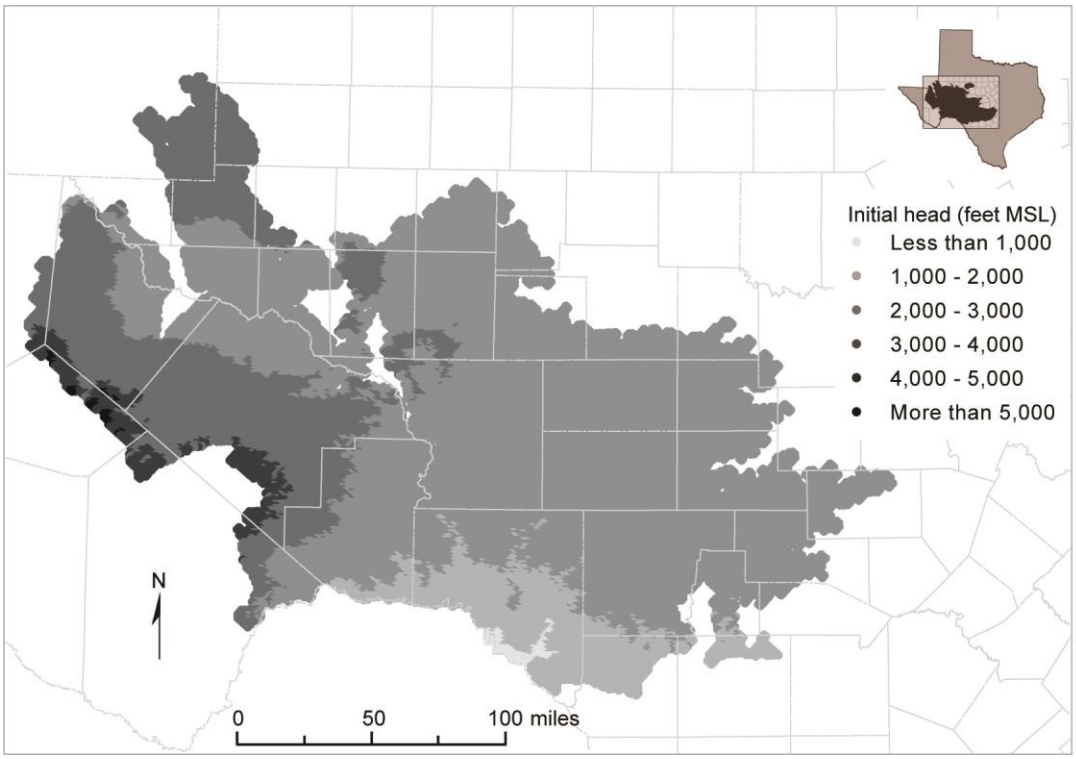

Figure 3. Initial hydraulic heads used in model simulations for layer 1. Note the use of grayscale shading to show differences.

EXHIBIT E
TWDB Guidelines for a Progress Report

Texas Water Development Board Contractors are required by their contracts to provide Progress Reports usually with the submission of an invoice/payment request.

The progress report should contain the following standard elements:

- Date: Date the memo is sent
- To: Freese and Nichols, Inc. and position of the reader
- From: Freese and Nichols, Inc. and position of the writer

Subject: TWDB Contract Number and a clear phrase that focuses the reader's attention on the subject of the memo

Work Completed: *(The next section of a progress report explains what work has been done during the reporting period. Specify the dates of the reporting period and use active voice verbs to give the impression that you or you and your team have been busy) For Example:*

Task 1: Completed 3 draft chapters and all appendices. Met with sub consultants on their chapters.
Task 2: Completed sample collection throughout river reach.
Task 3: No work completed in reporting period.

Problems:
If the reader is likely to be interested in the glitches you have encountered along the way, mention the problems you have encountered and explain how you have solved them. If there are problems you have not yet been able to solve, explain your strategy for solving them and give tell the reader when you think you will have them solved.

EXHIBIT F

HUB SUBCONRACTING PLAN PROGRESS ASSESSMENT REPORT

Use current form located at:
http:*I*/www.window.state.tx.us/procurement/pro
g/hub/hub-forms/