

DATA SHEET
Agenda No. 20.A.

Meeting Date: April 6, 2017

Agenda Item:

Consider approval of Task Order No. 2 to existing contract with Alan Plummer Associates, Inc. to provide water quality modeling and support for permitting activities for the Lakeview Plant TPDES Discharge Permit.

Placement:	<input type="checkbox"/> Consent	<input checked="" type="checkbox"/> Individual Consideration	<input type="checkbox"/> Executive Session
Vote:	<input type="checkbox"/> Non-Weighted	<input checked="" type="checkbox"/> Weighted Capital	
Recommending Department: Engineering			

Background:

The TCEQ recently upgraded their water quality model that is used to evaluate the effects that effluent discharged from wastewater treatments have on the receiving body of water. This new model indicates that a key parameter (dissolved oxygen) of water quality in Lewisville Lake cannot be maintained under reasonable permit limits for the Lakeview Plant. Alan Plummer Associates, Inc. (APAI) has confirmed these findings using TCEQ's model. However, they advise that the model may not reflect actual results for Lewisville Lake. The default TCEQ model tends to be simplistic and incorporates very conservative assumptions that may under-predict the lake's ability to assimilate the effluent. A more advanced model that incorporates site-specific factors is expected to confirm results that allow for more reasonable permit limits. APAI and staff have met with TCEQ, and the state has agreed to use the results from the more advanced model in setting the permit limits for the Lakeview Plant. **The goal is to help TCEQ identify reasonable permit limits for the plant, limits that are not overly stringent or costly.**

Under Task Order No. 2, Alan Plummer Associates, Inc. (APAI) will build a TCEQ-approved site-specific model that has the ability to demonstrate reasonable effluent limits. They have proposed using a phased approach where an uncalibrated model is developed using available data from public sources. If reasonable limits cannot be identified using this approach, field sampling will be conducted to calibrate the model parameters. If the model still cannot identify reasonable limits at the current outfall location, alternate outfall locations will be evaluated using the water quality model to identify a configuration that can meet Lake Lewisville DO standards. APAI will prepare a report with the findings and recommendations of the applicable phase or phases to submit to the TCEQ. APAI will coordinate with TCEQ and address its comments during its review of the report.

The proposed Task Order includes budget amounts of \$108,000 for Basic Services (uncalibrated model and report), and \$186,000 for Additional Services (data collection, model calibration, alternative outfall evaluation, and other project related unknowns). The total for the proposed Task Order is \$294,000.

Financial:

Funding for the project is included in the Capital Budget.

Recommendation:

Staff recommends approval of proposed Task Order No. 2.

Enclosures:

Draft Task Order No. 2.

Submitted By: 
Jody Zabolio, Acting Director of Engineering & Construction

Date: March 31, 2017

ALAN PLUMMER ASSOCIATES, INC.

ATTACHMENT A-1

Task Order No. 2

This Task Order is part of the AGREEMENT between Alan Plummer Associates, Inc. (the "ENGINEER"), and Upper Trinity Regional Water District (the "OWNER"), for a project generally described as:

REGIONAL WATER RECLAMATION SYSTEMS REGULATORY SUPPORT

The purpose of this Task Order is as follows:

To develop a more advanced, site-specific model using the United States Environmental Protection Agency (USEPA) Water Quality Analysis Simulation Program (WASP) software to simulate the water quality impacts of the discharge.

The Upper Trinity Regional Water District (OWNER) owns and operates the Lakeview Wastewater Treatment Plant (WWTP) in Denton County, TX. Currently, the Texas Commission on Environmental Quality (TCEQ) models for evaluating the discharge [i.e., CORMIX for evaluating dilution and CSTR for evaluating dissolved oxygen (DO) model] fail to demonstrate that DO standards in Lake Lewisville can be maintained under reasonable permit limits. In 2016, OWNER asked Alan Plummer Associates, Inc., (ENGINEER) to review the existing TCEQ model files. ENGINEER documented the results of the review in a report titled "*Lakeview Wastewater Treatment Plant - Review of TCEQ Modeling Files and Recommended Next Steps*" (APAI, 2016). The report was submitted to OWNER via an e-mail on November 22, 2016.

In summary, ENGINEER confirmed TCEQ's finding that reasonable effluent limits could not be identified with TCEQ models for a final phase discharge of 7.5 MGD. However, ENGINEER also noted that this did not necessarily imply that reasonable limits that maintain the DO standards cannot be identified if a more appropriate model is used. Default TCEQ CSTR models tend to be simplistic and incorporate very conservative assumptions that may under-predict the assimilative capacity of the receiving water body. For Lake Lewisville, a model that incorporates site-specific factors, such as vertical stratification, diffusion of the effluent from the outfall, and inflows from the surrounding watershed, may lessen the impact of the discharge. Taking into account these factors requires a more advanced, site-specific model.

Following is a project to develop a more advanced, site-specific model using the USEPA WASP software to simulate the water quality impacts of the discharge. The following scope of work identifies the types of services to be provided by ENGINEER pursuant to the development of such a model.

The objective of the modeling effort is to build a TCEQ-approved site-specific model that can demonstrate reasonable effluent limits. To avoid developing an unnecessarily complicated model from the outset (which would be more expensive and require more time), a phased approach is proposed where an uncalibrated model is developed first using available data from public sources such as TCEQ,

USGS and EPA. If reasonable permit limits cannot be identified using an uncalibrated model, field sampling may be considered to collect data to calibrate the model parameters. If the model cannot identify reasonable limits at the current outfall location even after calibration, a subsequent task could be authorized in which alternate outfall configurations are evaluated.

The four phases proposed are summarized as follows. Phases that are central to the development of the model and permitting support are highlighted as "Basic Services". Phases that are contingent on the results of other phases are highlighted as "Additional Services".

The decision tree for the phased approach is illustrated in Figure 1.

ARTICLE I
SCOPE OF SERVICES

The ENGINEER agrees to furnish the OWNER the following specific services:

BASIC ENGINEERING SERVICES

- A. Phase I: Development of uncalibrated WASP Model. A model will be developed using data compiled under a previous task order. The model will be initialized according to the TCEQ Standard Operating Procedures for model development. If reasonable limits can be identified with this model, a report will be prepared and coordination will be performed with TCEQ during its review of the report. If reasonable limits cannot be identified with the uncalibrated model, sensitivity analyses will be conducted on the model using realistic ranges of conditions that might be encountered in Lake Lewisville. The sensitivity analysis will support a determination of whether field sampling and calibration of the model, based on that data, has the potential to help in identifying reasonable permit limits. Phase I includes 1 meeting with the OWNER. ENGINEER will periodically update TCEQ modelers by telephone and email during the model development, but no meetings are included with the TCEQ. Processing the permit amendment is not included in this agreement.
- B. Phase IV: Preparation of Report. Findings of applicable phase or phases will be compiled into a report to submit to the TCEQ. ENGINEER will coordinate with the TCEQ and

address its comments during its review of the report. Up to 1 meeting with TCEQ will be conducted during this phase.

ADDITIONAL SERVICES

Additional services to be performed by the ENGINEER, if authorized by the OWNER, which are not included in the above-described Basic Engineering Services, are described as follows:

- A. Phase II: Field data collection and development of calibrated model.
 - a. Sampling will be performed in Lake Lewisville during critical months to accurately characterize conditions in the vicinity of the discharge.
 - b. Model parameters will be calibrated to the collected data. The calibrated model will be used to determine if reasonable permit limits can be identified.
 - c. If reasonable limits can be identified with the calibrated model, the report identified as Phase IV in Basic Services will be prepared
 - d. Up to 1 meeting with TCEQ will be held to coordinate development of the model.
- B. Phase III: Evaluation of alternate outfall locations. Alternate outfall locations will be evaluated using the water quality model to identify a configuration that can meet Lake Lewisville DO standards. This task does not include activities required to relocate the outfall such as engineering design, feasibility studies and additional permits. ENGINEER will assist in identifying those activities and recommend next steps associated with those activities. ENGINEER will meet with OWNER 1 time during the phase. ENGINEER will make 1 site visit to evaluate potential sites for alternative outfall locations
- C. Attending additional meetings or site visits beyond those specifically included in the Basic Services.
- D. Preparing applications and supporting documents for government grants, loans, or planning advances and providing data for detailed applications.
- E. Appearing before regulatory agencies or courts as an expert witness in any litigation or regulatory proceeding, including the preparation of engineering data and reports for assistance to the OWNER.
- F. Providing any additional services that may be required by the OWNER for completion of the project that are not included in the Basic or Additional Services.
- G. Tasks such as engineering design, feasibility studies and additional permits that would be required to implement an alternative outfall.

Lakeview Decision Tree

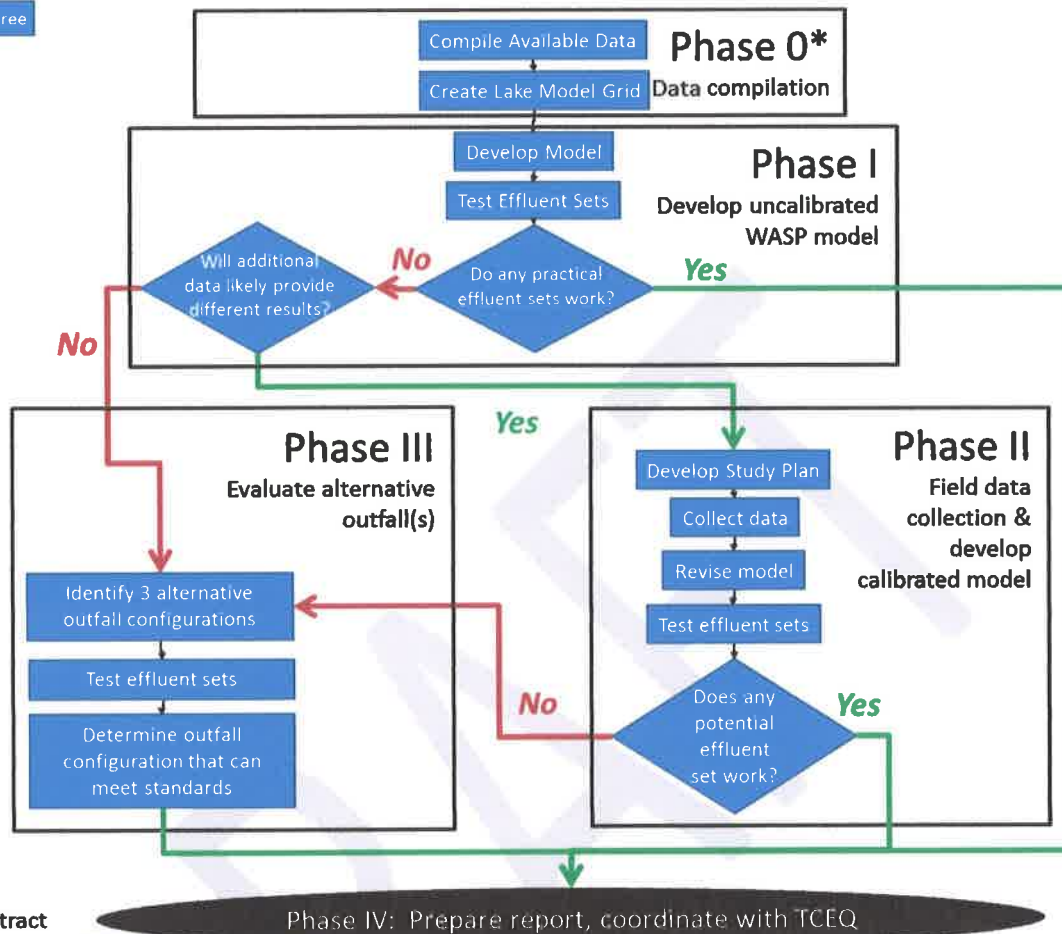


Figure 1. Lakeview Modeling Decision Tree

**ARTICLE II
COMPENSATION**

BASIC SERVICES

Compensation by the OWNER to the ENGINEER for Basic Services Item A enumerated in Task Order No. 3 will be on the actual labor hours and expenses incurred in performing the work, in accordance with Exhibit A. No work will be undertaken on this item without specific written authorization from the OWNER. The budget is shown below:

Item A	Development of Uncalibrated WASP Model	
	Not-to-Exceed	<u>\$ 90,000</u>

Compensation by the OWNER to the ENGINEER for Basic Services Item B enumerated in Task Order No. 3 will be on the actual labor hours and expenses incurred in performing the work, in accordance with Exhibit A-1. No work will be undertaken on this item without specific written authorization from the OWNER. The budget is shown below:

Item B	Preparation of Report	
	Not-to-Exceed	<u>\$ 18,000</u>

The total compensation for Basic Services authorized by Task Order No. 3 shall be \$ 108,000.

ADDITIONAL SERVICES

Compensation by the OWNER to the ENGINEER for Additional Services Item A enumerated in Task Order No. 3 will be on the actual labor hours and expenses incurred in performing the work, in accordance with Exhibit A. No work will be undertaken on this item without specific written authorization from the OWNER. The budget is shown below:

Item A	Field Data Collection and Development of Calibrated Model	
	Not-to-Exceed	<u>\$ 134,000</u>

Compensation by the OWNER to the ENGINEER for Additional Services Item B enumerated in Task Order No. 3 will be on the actual labor hours and expenses incurred in performing the work, in accordance with Exhibit A. No work will be undertaken on this item without specific written authorization from the OWNER. The budget is shown below:

Item B	Evaluation of Alternate Outfall Configurations	
	Not-to-Exceed	<u>\$ 32,000</u>

Compensation by the OWNER to the ENGINEER for Additional Services Tasks C-G enumerated in Task Order No. 3 will be based on the actual labor hours and expenses incurred in performing the work, in accordance with Exhibit A.

A budget allowance of \$20,000 has been made for tasks C-G and will not be exceeded without prior written authorization

from the OWNER. No work will be undertaken on this item prior to the specific written authorization from the OWNER.

The total compensation for Additional Services authorized by Task Order No. 3 shall be \$ 186,000.

TOTAL COMPENSATION SUMMARY

Basic Services Items A-B	\$ 108,000
Additional Services Items A-G	\$ 186,000
Total Authorization	\$ 294,000

OTHER PROVISIONS

The following provisions shall apply to this Task Order:

This Task Order No. 2 will become part of the referenced AGREEMENT when executed by both parties.

IN WITNESS WHEREOF, the parties execute below:

For the OWNER, Upper Trinity Regional Water District dated this _____ day of _____, 2017.

By: _____

Title: _____

For the ENGINEER, Alan Plummer Associates, Inc. dated this _____ day of _____, 2017.

By: _____
Jeffrey E. Caffey, P.E.

Title: Principal

DRAFT