

**INTERLOCAL COOPERATION AGREEMENT
BETWEEN
TEXAS A & M UNIVERSITY – CORPUS CHRISTI
AND
THE CITY OF CORPUS CHRISTI**

WHEREAS, Texas A & M University – Corpus Christi ("TAMUCC") and the City of Corpus Christi ("City") are authorized by Chapter 791 of the Texas Government Code to enter into an interlocal cooperation contract (the "Agreement");

WHEREAS, TAMUCC has been a partner in the City's air quality planning activities for the Coastal Bend Region through the TAMUCC's Pollution Prevention Partnership program;

WHEREAS, The City desires to continue its partnership with TAMUCC in this effort;

WHEREAS, the Corpus Christi Ozone Near Nonattainment Area Research and Planning Activities includes identifying sources of emissions, the development of pollution prevention strategies for reducing emissions, other action plans for improving the Corpus Christi area air quality and maintain compliance with federal ozone standards;

WHEREAS, the 86th Texas legislature at Article VI of the General Appropriation Act ("Rider 7") made funds available to the Texas Commission on Environmental Quality ("TCEQ") to conduct air quality planning activities in areas considered to be near non-attainment;

WHEREAS, The City entered into a State Funded Grant Agreement ("Grant"), Contract No. 582-20-11981 with the TCEQ for air quality planning activities in areas considered to be near non-attainment for the ozone standard under the Federal Clean Air Act Amendments of 1990, which activities may include without limitation identifying, inventorying, and monitoring of current pollution levels; modeling future pollution levels and the identification and quantification of potential pollution reduction through voluntary control, and which activities will be consistent with TCEQ monitoring, inventory and modeling approaches and infrastructure, and conduct air quality planning activities in the Coastal Bend Region;

WHEREAS, an element of the City's proposal for the Grant was TAMUCC's proposed "Corpus Christi Ozone Near Nonattainment Area Research and Planning Activities" as a continuation of the City's Regional Air Quality Program;

WHEREAS, the grant provides funding for Corpus Christi Ozone Near Nonattainment Area Research and Planning Activities and other types of air

quality planning activities and projects that the City, in cooperation with its partners, will complete by December 31, 2021 (and possibly later if the Grant is extended based on authority received from the Texas Legislature to carry forward near non-attainment contract related monies from the 2015-2016 biennium into the 2016-2017 biennium) detailed in a Work Plan approved by the TCEQ, which is attached hereto as **Exhibit A** and incorporated by reference as if laid out here in its entirety;

WHEREAS, TAMUCC has received a copy of TCEQ Contract No. 582-20-11981, including the Work Plan, and agrees that it can perform the work in accordance with the Work Plan; and

WHEREAS, the technical support contemplated by this Agreement is of mutual interests and benefit to TAMUCC and City; it will further the status the instructional and research objectives of TAMUCC, in a manner consistent with its status as an agency of the State of Texas; and it will help the City accomplish objectives of its "Ozone Advance Intergovernmental Agreement" with the United States Environmental Protection Agency ("EAP") and TCEQ;

NOW, THEREFORE, the parties hereto agree as follows;

1. **GRANT SUBCONTRACT.** Both the City and TAMUCC acknowledge that this Agreement is a subcontract to the City's Grant from TCEQ (TCEQ Contract No. 582-20-11981) and that the terms and conditions of the Grant control the administration and execution of this contract.

a. The TCEQ Grant No. 582-20-11981 is incorporated into this Agreement by reference and is available upon request. A copy of TCEQ Contract No. 582-20-11981 has been provide to TAMUCC.

b. In the event any provision of this Agreement conflicts with terms of the Grant, the terms of the Grant control the administration and execution of this Agreement.

c. TAMUCC agrees to comply with all requirements imposed by TCEQ that are applicable to subcontractors.

d. TAMUCC agrees to conduct all of its activities in compliance with the terms of the Grant, and not to take any action that would cause or contribute to the City defaulting upon the terms of the Grant.

e. TAMUCC shall be responsible for the professional quality, technical accuracy, timely completion and the coordination of all services and other work furnished by TAMUCC under this Agreement. TAMUCC must perform the work in conformity with the standards and guidance documents provided by the TCEQ, the City and TCEQ may withhold reimbursement for costs of non-conforming work.

2. STATEMENT OF WORK. TAMUCC agrees to use its best efforts to execute the Work Plan document, as provided in Exhibit A, that describes down to the task level (Task 3) the projects in support of the State Implementation Plan (SIP) development process and other types of air quality planning activities and projects that the City, in cooperation with its partners, will complete by December 31, 2021 as described in the Rider 7 Funding Request work Plan for a Corpus Christi Pollution Prevention Partnership and Educational Outreach Program, Attachment B to TCEQ Contract No. 582-20-11981.

3. PRINCIPAL INVESTIGATORS. The program will be supervised by Dr. J. David Felix, of the Department of University Outreach. If, for any reason, Dr. Felix is unable to continue to serve as Principal Investigator, and a successor acceptable to both TAMUCC and the City is not available, the Agreement shall be terminated as provided in paragraph 7.

4. PERIOD OF PERFORMANCE. The program shall be conducted from the execution date of the contract through December 31, 2021.

5. PRICE AND PAYMENT. As compensation for the performance of the Agreement, the City agrees to reimburse TAMUCC up to \$150,499.58 for expenses authorized under the Grant.

a. This agreement is funded exclusively from funds made available to the City by the Grant. The City's obligation is limited by the provisions of the Grant. The City is not liable to make payment to TAMUCC, if funding is not available from TCEQ through the Grant. Payments may not exceed \$150,499.58 from the execution of this Agreement to December 31, 2021.

b. All contractual expenditures reimbursed with funds provided under this Agreement shall meet all procurement laws and regulations applicable to TAMUCC and the Uniform Grant Management Administration and the Uniform Grants Management Standards. Note that competitive bidding will generally be required for contracts with entities other than local governments and state and federal agencies. Note also that the Common Rule of OMB Circular A-102, as adopted in the UGMS, precludes the use of the cost plus a percentage of cost of contracting.

c. Any payment made by either the City or TAMUCC for any of the services provided pursuant to this Agreement shall be made out of current revenues available to such parties as required by the Interlocal Cooperation Act. All funding obligations of TAMUCC and the City under this Agreement are subject to the appropriation of funds by each entity in its annual budget.

d. TAMUCC shall forward any proposed sub-agreement providing for the performance of services under this Agreement to the City prior to execution of the sub-agreement. Neither the City's nor TCEQ's failure to question a sub-

agreement nor its subsequent withdrawal of any questions raised regarding sub-agreement shall in any way imply the City's or TCEQ's approval of the sub-agreement's purpose or method of procurement of the sub-agreement. Further, the terms of this provision do not in any way restrict the City's and TCEQ's rights under this Agreement or the Grant to subsequently refuse reimbursement for expenses incurred pursuant of the sub-agreement. TAMUCC may require a bid bond to protect the local and state interests by assuring that the bidder will, upon acceptance, execute all required contractual documents within the time period specified.

e. Invoices for compensation shall be submitted to the following address:
City of Corpus Christi
Attn: Sharon Bailey Lewis
P.O. Box 9277
Corpus Christi, TX 78469-9277

6. DELIVERABLES. The deliverables required under this Agreement are specified in Exhibit A, the Work Plan.

7. TERMINATION. Performance under this Agreement may be terminated by the City upon sixty days' written notice. Performance may be terminated by TAMUCC, if circumstances beyond its control preclude continuation of the Program. Upon termination, TAMUCC will be reimbursed for costs and non-cancelable commitments incurred in the performance of the program, that are reimbursable under the Grant. However, reimbursement may not exceed the total estimated cost specified in paragraph 5.

8. INSURANCE. The City understands that TAMUCC is a Texas governmental entity subject to certain liability limitations under the law. Accordingly, the City will accept a self-insurance letter from TAMUCC for the insurance requirements under this Agreement. Before performance by any subcontractors can begin under this Agreement, TAMUCC must deliver a certificate of insurance ("COI") for the subcontractors, as proof of the required insurance coverages, to the City. The City Attorney must be given copies of all insurance policies within 10 days of the City Manager's written request. Insurance requirements are as stated in the attached **Exhibit B**, the content of which is incorporated by reference into this Agreement as if fully set out here in its entirety.

9. INTELLECTUAL PROPERTY.

a. Royalties and patent fees. TAMUCC shall pay all license fees, royalties and assume all costs incident to the use or possession in performance of the Work or incorporation in Work of any Intellectual Property.

b. Disclosure of Intellectual Property Produced during the Work. TAMUCC shall promptly notify the City and TCEQ of all Intellectual Property that TAMUCC or TAMUCC's employees, subcontractors, or subcontractor's employees may produce, either solely or jointly with others during the course of Work. In addition, TAMUCC shall promptly notify the City and TCEQ of all intellectual property which TAMUCC may acquire in connection with the performance of the work. Any notification under this paragraph shall contain sufficient technical detail to convey a clear understanding of the intellectual property, and shall identify any publication, sale, public use, or impending publication. Promptly upon request TAMUCC shall supply additional information as the City and TCEQ may request.

c. Failure to Protect Intellectual Property. If TAMUCC fails to protect any intellectual property produced in the course of performing the work, the City and TCEQ shall have full authority to protect, assume and retain all intellectual property rights in any and all intellectual property.

d. Non-Interference with Intellectual Property Rights of City and TCEQ. TAMUCC agrees that its agents and its employees shall not in any manner use, sell, distribute, disclose or otherwise communicate any portion of intellectual property owned by or licensed to the City or TCEQ, except in the course of performing the work, unless TAMUCC has independent intellectual property rights to the intellectual property.

e. Grant license. With respect to any intellectual property as is (i) incorporated in the work (other than intellectual property for which the City and TCEQ already possess equal or greater intellectual property right by virtue of this Agreement or otherwise) or (ii) produced by TAMUCC or TAMUCC's employees, subcontractors, or subcontractor's employees during the course of performing the work, TAMUCC hereby grants to the City and TCEQ (i) a nonexclusive, perpetual, irrevocable, enterprise-wide license to reproduce, publish, or otherwise use the intellectual property and associated use documentation, and (ii) a nonexclusive, perpetual irrevocable enterprise-wide license to authorize others to reproduce, publish, or otherwise use Intellectual property for the City's and TCEQ's purposes.

f. Modification; Derivative Works. The City and TCEQ shall have the right at their own discretion, to independently modify any intellectual property to which license is granted for the City and TCEQ's own purposes and use, through the services of its own employees or independent contractors. The City and TCEQ shall own all intellectual property right to the modifications. TAMUCC shall not incorporate any modifications into its intellectual property for distribution to third parties unless it first obtains a license from the City or TCEQ.

g. Compliance with Applicable Laws and Regulations, TAMUCC shall comply with all laws and regulations relating to intellectual property.

h. Warranties relating to Intellectual Property Rights. TAMUCC represents and warrants to the City and TCEQ that TAMUCC will not infringe any intellectual

property right of any third party. TAMUCC further represents and warrants to the City and TCEQ that in the course of performing the work it will not use or possess any intellectual property owned by a third party without paying any required royalty or patent fees. TAMUCC warrants that it has full title in and ownership of intellectual property and any enhancements, updates or other modifications, or that it has full power and authority to grant all licenses granted in this Agreement, and that the licensed used by the City and TCEQ will in no way constitute an infringement or other violation of any intellectual property right of any third party. The TAMUCC warrants that it shall have, throughout any applicable license term under this Agreement, free and clear title to, or the right to possess, use, sell, transfer, assign, license, or sublicense products that are licensed or provided to the City and TCEQ by TAMUCC. Except as permitted in this Agreement and the Grant, TAMUCC shall not create or permit the creation of any lien, encumbrance, or security interest in the work or any part thereof, or any product licensed or provided to the City and TCEQ for which title has not yet passed to the City and TCEQ, without prior written consent of the City and TCEQ. TAMUCC represents and warrants to the City and TCEQ, that neither it nor any other company or individual performing work is under any obligation to assign or give to any third party any intellectual property rights granted or assigned to the City and TCEQ, or reserved by the City and TCEQ, under this Agreement and the Grant.

9. RELEASE OF INFORMATION. TAMUCC shall acknowledge the City and TCEQ, the TAMUCC investigator, the nature of the program, and the dollar value of the Agreement in TAMUCC records and reports. Any reports and other documents completed as part of this Agreement, other than documents prepared exclusively for internal organizational use by TAMUCC, shall carry the following notation on the front cover or title page.

"PREPARED IN COOPERATION WITH TEXAS COMMISSION IN ENVIRONMENTAL QUALITY AND THE CITY OF CORPUS CHRISTI"

10. TITLE TO EQUIPMENT. Subject to the obligations and conditions set forth in this Agreement and the Grant, title to all equipment acquired under this Agreement shall vest, upon acquisition or construction, in TAMUCC.

a. TAMUCC agrees to conduct physical property inventories, to maintain property records and necessary control procedures, and to provide adequate maintenance with respect to all equipment acquired under this Agreement.

b. TAMUCC may develop and use its own property management system which must conform to all applicable State and Local laws, rules and regulations. If an adequate system for accounting for personal property owned by TAMUCC or its subcontractors is not in place or currently in use, TAMUCC shall contact the State of Texas Comptroller of Public Accounts and request the State Property Accounting User's Guide (#96-418) and the State Property Class Code List.

TAMUCC agrees to use these as guides for establishing a property management system.

c. Property records must be maintained that include a description of the property, a serial number or other identification number, the source of property, who hold title, the acquisition date, and the cost of the property, percentage of federal participation in the cost of property, the location, use and condition of the property, and any ultimate disposition data including the date of disposal and sale price of the property.

d. A physical inventory of all equipment acquired or replaced with funds provided under this Agreement having an initial purchase price of One Thousand Dollars (\$1,000) or more, shall be conducted no less frequently than once every two years and the results of the inventories reconciles with the appropriate property records. Property control procedures utilized by TAMUCC shall include adequate safeguards to prevent loss, damage, or theft of acquired property. Any loss, damage or theft shall be investigated. TAMUCC agrees to develop and carry out a program of property maintenance as necessary to keep both originally acquired and any replaced property in good condition, and to utilize proper sales procedures to ensure the highest possible return, in the event the equipment is sold.

e. Use of Equipment Acquired with Funds Provided Under this Agreement.

1) Equipment shall be used by TAMUCC or its subcontractors in the program or project for which it was acquired as long as needed, whether or not the project program continues to be supported by state funds. When no longer needed for the original program or project, the equipment may be used in other activities currently or previously supported by a federal or state agency.

2) TAMUCC or its subcontractors shall also make equipment available for use on other projects or programs currently or previously supported by the federal or state government, providing the use will not interfere with the work on the projects or program for which it was originally acquired. First preferences for other use shall be given to other programs or projects supported by the awarding agency.

3) When acquiring replacement equipment, TAMUCC or its subcontractors may use the equipment to be replaced as a trade-in or sell the property and use the proceeds to offset the cost of the replacement property, subject to the approval of the awarding agency.

f. Disposition of Equipment Acquired with Funds Provided Under this Agreement. When the original or replacement equipment is no longer needed for the original project or program or for other activities currently or previously supported by a federal or state agency, disposition of the equipment may be made as follows:

1) Equipment with a current per-unit fair market value of less than \$1000 may be retained, sold or otherwise disposed of with no further obligation to the TCEQ. Methods used to determine per-unit fair market value must be documented, kept on the file and made available to the TCEQ upon request.

2) Equipment with a current per-unit fair market value of \$1,000 or more must be disposed of as follows:

a) Prior to the termination date of this Agreement, TAMUCC and its subcontractors must notify the TCEQ. TCEQ may require TAMUCC or subcontractors to transfer title and possession to the equipment to the TCEQ or a third party named by the TCEQ or may alternatively authorize disposition by sale, transfer or in another manner.

b) If, within six years of the initiation date of the Agreement, equipment is sold or transferred, TAMUCC must remit to TCEQ a share of the proceeds from the sale, provided the fair market, per-unit value of the property at the time of the sale is in excess of one thousand dollars (\$1,000). The TCEQ's share of the sale proceeds shall be the same percentage as was the funding provided under this Agreement that enabled the original purchase in question.

11. NOTICES. All notices to the parties under this Agreement shall be in writing and sent to the names and address stated below. Either party to the Agreement may change the name and address by notice to the other in accordance herewith, and any change shall take effect immediately upon receipt of the notice.

TAMUCC

Texas A&M University – Corpus Christi
6300 Ocean Drive, NRC #2200
Corpus Christi, TX 78412
Attn: J. David Felix Ph.D.
Telephone: (361) 825-4180

City of Corpus Christi

City of Corpus Christi
Attn: Sharon Bailey Lewis
P.O. Box 9277
Corpus Christi, TX 78469
Telephone: (361) 826-4066
Fax: (361) 826-3200

12. Export Administration.

a. It is understood that TAMUCC is subject to United States laws and regulations controlling the export of technical data, computer software, laboratory prototypes and other commodities, and that its obligations under this Agreement are contingent upon compliance with applicable United States export laws and regulations. Furthermore, it is understood that the transfer of certain technical data and commodities may require a license from one or more agencies of the United States Government.

b. Both TAMUCC and City hereby agree and warrant that the program and development contemplated under this Agreement, and any exchange of technical data, computer software or other commodities resulting from this Agreement, shall be conducted in full compliance with the export control laws of the United States.

13. LIABILITY. IT IS UNDERSTOOD THAT THE CITY SHALL NOT BE LIABLE FOR ANY CLAIMS AGAINST TAMUCC, ITS EMPLOYEES, OR THIRD PERSONS, OTHER THAN CITY'S EMPLOYEES, FOR DAMAGE RESULTING FROM OR ARISING OUT OF THE ACTIVITIES OF TAMUCC PERSONNEL UNDER THIS AGREEMENT, AND TAMUCC AGREES, TO THE EXTENT PERMITTED BY SECTION 49, ARTICLE III OF THE CONSTITUTION OF THE STATE OF TEXAS, TO HOLD CITY HARMLESS FROM ANY AND ALL CLAIMS. IT IS ALSO UNDERSTOOD THAT TAMUCC SHALL NOT BE HELD LIABLE FOR ANY CLAIMS AGAINST CITY'S EMPLOYEES, OF DAMAGE RESULTING FROM OR ARISING OUT OF ACTIVITIES OF THE CITY OR ITS EMPLOYEES, AND CITY AGREES, TO THE EXTENT PERMITTED BY SECTION 49, ARTICLE III OF THE CONSTITUTION OF THE STATE OF TEXAS, TO HOLD TAMUCC HARMLESS FROM ANY AND ALL CLAIMS.

14. INDEPENDENT CONTRACTOR. For the purpose of the Agreement and all services to be provided under this Agreement, the parties shall be, and shall be deemed to be, independent contractors and not agents or employees of the other party. Neither party shall have authority to make any statements, representations or commitments of my kind, or to take any action which shall be binding on the other party, except as may be explicitly provided for in this Agreement or authorized in writing.

15. AMENDMENTS AUTHORIZED.

a. The representatives who were authorized to sign this Agreement are authorized to execute minor amendments to this Agreement, such as changes in deadlines and minor changes in the scope of work.

b. Any amendments to this Agreement resulting from amendments to the Grant that increases the scope of work under this Agreement due to TCEQ's award of additional funding to the City as a result of the work plan prepared by TAMUCC under this Agreement must be authorized by the City Council and the funds appropriated before an amendment to this Agreement is executed.

c. Any amendments to this Agreement increasing or decreasing the amount the City is obligated to pay TAMUCC by more than \$25,000 must be authorized by the City Council before an amendment to this Agreement is executed.

16. SEVERABILITY. If any of the provisions of the Agreement in the application thereof to any person or circumstance, is rendered or declared illegal for any reason, or shall be invalid or unenforceable, the remainder of the Agreement and the application of the provisions to other persons or circumstances shall not be affected thereby, but shall be enforced to the greatest extent allowed by applicable law. The City and TAMUCC agree that this Agreement shall be reformed to replace the stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

17. DISPUTE RESOLUTION PROCESS.

a. To the extent applicable, the dispute resolution procedures provided in Chapter 2260 of the Texas Government Code will be used to resolve contract claims under this contract.

b. If the Chapter 2260 procedures are utilized both parties agree the TCEQ may intervene in the proceedings as an interested party.

c. The Director of Procurement and Disbursements, TAMUCC, is designated as the officer designated under §2260.052, Texas Government Code, to examine claims and counterclaims, negotiate, and resolve any claims on behalf of TAMUCC.

18. VENUE. TAMUCC acknowledges and agrees that because this Agreement has been executed, and will be administered in Nueces County, Texas, the Agreement is to be performed in Nueces County. TAMUCC acknowledges and agrees that any permissible cause of action involving this Agreement will arise solely in Nueces County. If a legal action relating to this claim is permissible and there are two or more counties or proper venue under the rules of mandatory, general, or permissive venue and one of the counties is Nueces County, TAMUCC agrees to venue in Nueces County. This provision does not waive the City's sovereign immunity.

19. MISCELLANEOUS. This Agreement constitutes the entire agreement between the parties relative to the subject matter and may only be modified or amended by a written agreement signed by both parties. It shall be construed in accordance with the laws of the State of Texas.

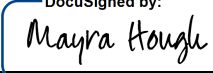
20. AUTHORIZATION OF GOVERNING BODIES. The individuals executing this Agreement certify that this interlocal agreement has been authorized by the

Governing Body for their entity, as required by Section 791, Texas Government Code.

21. NO WAIVER OF IMMUNITY. No party hereto waives or relinquishes any immunity or defense on behalf of itself, its officers, employees and agents as a result of its execution of this Agreement and performance of the covenants contained herein.

IN WITNESS WHEREOF, the parties have caused this agreement to be executed by their authorized representative.

Texas A&M University – Corpus Christi

DocuSigned by:

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Mayra Hough
Director of Sponsored Research

Date: 9/8/2020

CITY OF CORPUS CHRISTI

Kim Baker
Director of Contracts and Procurement

Date: _____

ATTEST:

Rebecca Huerta
City Secretary

Date

APPROVED AS TO LEGAL FORM:

Assistant City Attorney

Date

Corpus Christi Air Monitoring and Ozone Status (2020-2021)

Project Coordinator

J. David Felix

Assistant Professor of Environmental Chemistry

Center for Water Supply Studies

Department of Physical and Environmental Sciences

Texas A&M University – Corpus Christi

6300 Ocean Drive, Corpus Christi, TX 78412

Project Overview:

The Texas Commission on Environmental Quality (TCEQ) is supporting air quality monitoring by the Performing Party, the City of Corpus Christi, as part of Rider 7 State and Local Air Quality Planning Program. The project tasks include assessing the current condition of instrumentation at four air quality monitoring sites, monitoring air quality components and generating a conceptual ozone model. Dr. J. David Felix (TAMU-CC) and his research group will be collaborating with the City of Corpus Christi to accomplish these tasks and submit air monitoring data to TCEQ. The work plan is presented below as three primary tasks:

	Title	Start	Finish
Task 1	Assess current condition of air monitoring instrumentation	Sept 2020	Oct 2020
Task 2	Monitor ambient air quality	Sept 2020	Dec 2021
Task 3	Create conceptual ozone model	Dec 2020	Dec 2021

Task 1: Assess condition of current air monitoring instrumentation

The four proposed air monitoring sites (Figure 1) are not currently operating and the status of the instrumentation (Table 1) is unknown. Dr. Felix has been in communication with sales representatives and technicians at the associated instrument companies and has discussed troubleshooting and restart procedures for idle instrumentation. Depending on the condition of the instrumentation, replacement parts and/or new instrumentation will be ordered. Dr. Felix has received quotes from respective companies (Table 2).

Total Cost for Task 1: \$85,037.58 (**This cost is based on all instrumentation being replaced so this cost is extremely variable depending on instrumentation condition.*)

Task 1 Deliverables	Date
QAPP preparation and submission	Aug/Sept 2020
Assessment of current condition of instrumentation sites	Aug/Sept 2020
Order replacement parts and/or replacement instrumentation	Aug/Sept 2020
Install new parts/instrumentation	Sept/Oct 2020

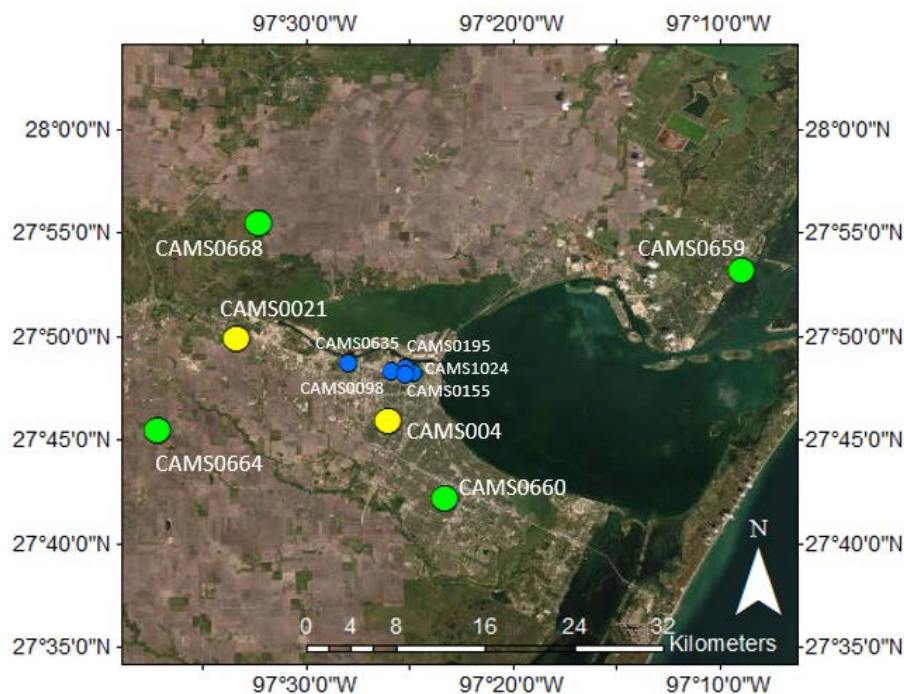


Figure 1. Air monitoring sites to be maintained in the Corpus Christi urban airshed as part of this project (green circles), current operational ozone sites (yellow circles) and current operational VOC site (blue circle).

Table 1. Air monitoring sites and equipment to be checked/operated.

Location	Instrumentation	Instrumentation status
Holly Road site (CAMS 660)	Teledyne API 400E ozone analyzer, F460 wind sensors, Coastal environmental Atmospheric Temperature/Relative Humidity (AT/RH) sensor, Zeno 3200 datalogger, and Enfora wireless modem.	Unknown
Aransas Pass site (CAMS 659)	Teledyne API 400E ozone analyzer, RM young wind sensors, Coastal environmental Atmospheric Temperature/Relative Humidity (AT/RH) sensor, Zeno 3200 datalogger, and Enfora wireless modem.	Unknown
Violet site (CAMS 664)	Teledyne API 400E ozone analyzer, RM young wind sensors, Coastal environmental Atmospheric Temperature/Relative Humidity (AT/RH) sensor, Zeno 3200 datalogger, and Enfora wireless modem.	Unknown
Odem site (CAMS 686)	Teledyne API 400E ozone analyzer, F460 wind sensors, Coastal environmental Atmospheric Temperature/Relative Humidity (AT/RH) sensor, Zeno 3200 datalogger, and Enfora wireless modem.	Unknown

Table 2. Costs for potential air monitoring instrumentation replacements.

Quantity	Company	Instrument	Measurement/Purpose	Price
1	Teledyne	Model N500 CAPS True NO ₂ /NO _x /NO Analyzer	NO _x measurements	\$15,506.20
1	Teledyne	Model T400 UV Absorption O ₃ Analyzer	Ozone measurements	\$9,206.20
1	Teledyne	Model T701 Zero Air System	Produces clean air for calibration	\$7,354.50
1	Teledyne	Model T700U Dynamic Dilution Calibrator	Calibrate all NO _x and O ₃ monitors	\$20,764.00
1	Campbell Sci	HygroVUE5-10-PT	Relative Humidity and Temperature measurement	\$315.44
1	Campbell Sci	RAD06	Shield for hygrovue5 sensor	\$120.00

1	Campbell Sci	HYGROVUE10-10-PT	Relative Humidity and Temperature measurement	\$402.40
1	Campbell Sci	RAD10E	Shield for hygrovue10 sensor	\$172.80
1	Campbell Sci	HMP155A-L10-PT	Relative Humidity and Temperature measurement	\$751.90
1	Campbell Sci	RAD14	Shield for hmp155A sensor	\$206.40
1	Campbell Sci	03002-L10-PT Wind Sentry Set	Wind speed and direction measurement	\$677.98
1	Campbell Sci	CM220	Mounting kit for 03002 or 05108	\$33.60
1	Campbell Sci	05108-L10-PT Wind Monitor-HD	Relative Humidity and Temperature measurement	\$1,347.10
1	Campbell Sci	WINDSONIC1-L10-PT 2-D Sonic Wind Sensor	Relative Humidity and Temperature measurement	\$1,135.50
1	Campbell Sci	34244 MetSENS-Series or Windsonic-Series Mounting	Mounting kit for WINDSONIC1-L10-PT	\$64.32

Task 2: Ambient Air Monitoring

There are currently only two stations in the Corpus Christi airshed monitoring ozone levels (CAMS004, 0021). At these sites, recent daily data from June 2020 (Figure 2) indicates the airshed is in attainment according to the 8-hour ozone standard (70 ppb) set by the EPA but daily maximums did exceed this limit. While planned industrial and port growth in the region will be beneficial to the regional economy, it will inevitably increase ozone precursors. Therefore, it is vital to determine current ozone dynamics while Corpus Christi is within attainment to understand how increasing precursors may jeopardize this attainment status. This project will monitor ambient ozone concentrations at four additional air monitoring sites (CAMS659, 660, 664, 686). Relative humidity, temperature, and wind speed/direction will also be measured at each site and NO_x concentrations will be measured at one site (CAMS660).

NO_x and VOCs are primary ozone precursors but the relationship between these precursors and ozone formation is not linear (Figure 3). Despite these direct impacts on ozone formation, the Corpus Christi airshed does not currently have a NO_x monitoring station while it has five centrally located VOC monitoring stations (1 AutoGC, 1 TNMOC, 4 canister) (Figure 2). Depending on atmospheric conditions, ozone formation can be almost exclusively controlled by NO_x and mostly independent of VOCs. However, there are also conditions where ozone formation can increase with VOC concentrations while not increasing or even decreasing with increasing NO_x. Due to this nonlinear chemistry between precursors and product, determining whether ozone formation in an air shed is “NO_x or VOC sensitive” has proven difficult. Preliminary passive ambient NO₂ measurements conducted by the Dr. Felix’s group have suggested the Corpus Christi airshed is NO_x sensitive but continuous NO_x monitoring is necessary to determine if the airshed is in a “NO_x or VOC sensitive” regime. The NO_x data provided by this project along with currently available VOC data will help determine if stakeholders should focus resources on future NO_x or VOC controls to mitigate ozone increases.

Dr. Felix’s group in collaboration with the City of Corpus Christi will maintain the monitoring sites and compile ozone, ozone precursor, and atmospheric condition data sets which will support the conceptual ozone model produced in Task 3.

Total Cost for Task 2: \$15,000 (gas calibrants, maintenance, parts)

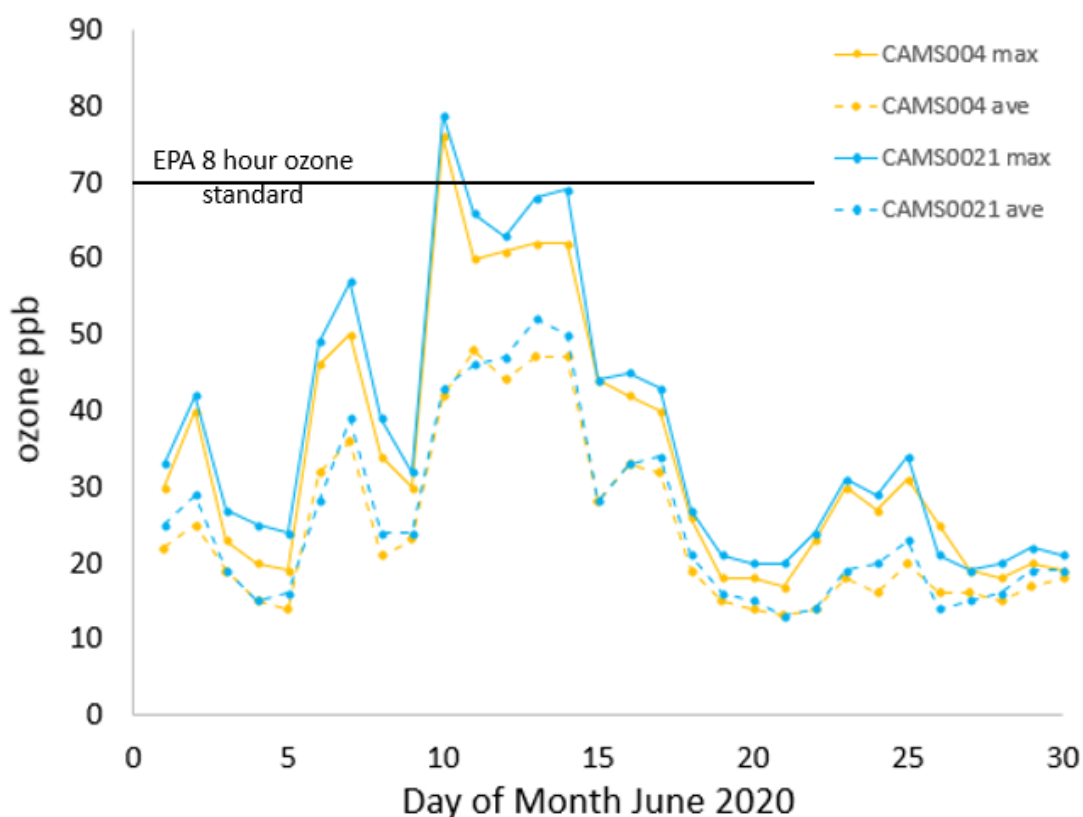


Figure 2. Current daily average and maximum ozone levels at operational Corpus Christi monitoring sites. Note daily maximums exceed the 8-hour EPA standard.

Task 2 Deliverables	Date
Instrument maintenance and calibration	Sept 2020 to Dec 2021
Quarterly data reports	Quarterly by the 30 th of Dec, Mar, June, & Sept
Final data report	Dec 2021

Task 3: Create Conceptual Ozone Model

Dr. Felix's research group will report atmospheric conditions and chemical precursor concentrations associated with high or standard exceeding ozone measurements in the Corpus Christi airshed. Atmospheric conditions (i.e. wind direction, wind speed, relative humidity, temperature) will be obtained directly at each site while precursor data (i.e. NO_x and VOC) will be obtained from the nearest monitoring site. The conceptual ozone model will be developed through the following investigations and analyses:

- Evaluate wind speeds, wind directions, relative humidity and temperature associated with background and high ozone events to determine the local conditions and sources associated with high/low ozone levels
- Determine diurnal and seasonal trends associated with background and high ozone levels
- Develop 24-hour air mass back trajectories using NOAA HYSPLIT software to

determine source regions likely to affect local area ozone.

- Perform weekday vs. weekend analysis to evaluate the potential effectiveness of reduced levels of local industrial and mobile source activity
- Address additional relevant questions listed in Section 11.1.1 of EPA's ozone modeling guidance document, *Guidance on the Use of Models and Other Analyses to Demonstrating Attainment of Air Quality goals for Ozone, PM_{2.5}, and Regional Haze*.
- Investigate ozone and precursor trends and determine the annual frequency of high ozone days
- Create ozone isopleth (Figure 3) by plotting ozone concentrations vs. available NO_x (CAMS0660) and VOC (CAMS1024) concentration data in order to determine NO_x vs. VOC limited scenarios in the Corpus Christi airshed

Total Cost of Task 3: \$50,462 (This is the Felix Group budget and is inherent in all tasks)

Total Cost All Tasks: \$150,499.58

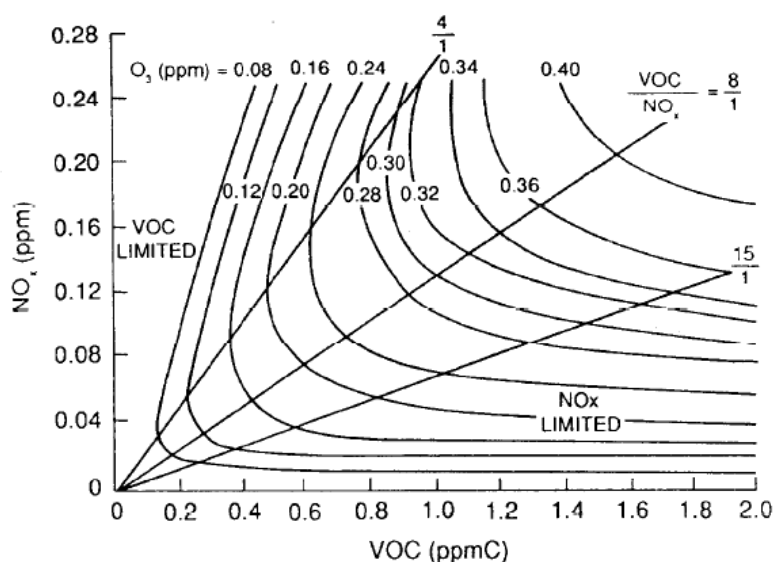


Figure 3. General isopleth depicting the relationship between ozone concentrations and its precursors, VOC and NO_x. Isopleths can be used to determine if an airshed is VOC or NO_x limited in relation to potential for increased ozone levels (NRC 1991).

Task 3 Deliverables	Date
Preliminary conceptual model updates with quarterly reports	Quarterly by the 30 th of December, March, June, & September
Final conceptual model with final report	December 2021

Preliminary Felix Group Budget

Budget Category	Cost
Salary / Wages	\$22,198
Principal Investigator (176 hours @ \$44.31) and Graduate Assistant (1068 hours @ \$13.26)	
Fringe Benefits	\$7,146
Travel	\$6,000
Supplies	\$2,000
Equipment	
Contractual	
Construction	
Other (Tuition)	\$9,384
Indirect Costs (10%)	\$3,734
Total	\$50,462

Budget Justification**1. Salaries, Wages and Fringe Benefits for Personnel**

One month of salary based on 8.33% annual effort for Dr. Felix is requested (**\$7,798**). Dr. Felix will provide logistical support for all instrumentation assessment and air monitoring. He will also train and supervise graduate students and prepare quarterly and final reports.

Graduate Research Assistant (GRA) (**\$14,400**) support is required to cover salary for one MS student during 12 months of the project. The student will be involved in collecting, processing, and analyzing the data under the supervision of the Dr. Felix.

Fringe benefits are calculated at the TAMU-CC rates of 18.2% for faculty (the PIs) and 10.7% for students (GRA and USR). Insurance benefits are calculated at the Texas A&M System rate of \$746 per month for faculty (PI) and \$412 per month for students (GRA).

Total Salaries and Wages: \$22,198

Total Fringe Benefits: \$7,146

2. Domestic Travel

Monitoring site and training travel (**\$6000**): Travel funds are requested for Dr. Felix and the GRA to visit the monitoring sites for regular calibration and maintenance needs. The instrument company Teledyne offers training courses on their NO_x and ozone analyzers. Travel funds are requested for the GRA to attend these training sessions to become an expert in instrumentation troubleshooting. This would ultimately save money on in-field tech support or instrument refurbishment and supply valuable training for a graduate student who will be seeking future employment in the air quality field.

3. Supplies (\$2,000): Data backup and IT support.

4. Other: Graduate Student Tuition (\$9,384): Funds are requested to cover tuition and fees for the GRA for two of the three semesters covering the duration of the project.

5. Indirect Costs (10%) (\$3,734)

Total: \$50,462

Reference:

National Research Council. Rethinking the Ozone Problem in Urban and Regional Air Pollution.
National Academy Press, Washington, D.C., 1991.