

AIR QUALITY RESEARCH PROGRAM

**Texas Commission on Environmental Quality
Contract Number 582-15-50047
Awarded to The University of Texas at Austin**

**Quarterly Report
December 1, 2019 – February 29, 2020**

Submitted to

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Texas Air Quality Research Program

Quarterly Report

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OVERVIEW

The goals of the State of Texas Air Quality Research Program (AQRP) are:

- (i) to support scientific research related to Texas air quality, in the areas of emissions inventory development, atmospheric chemistry, meteorology and air quality modeling,
- (ii) to integrate AQRP research with the work of other organizations, and
- (iii) to communicate the results of AQRP research to air quality decision-makers and stakeholders.

PROGRAM ACTIVITIES FOR THE QUARTER

Between December 1, 2019 and February 29, 2020, the AQRP Project Administration efforts focused primarily on finalizing project invoices, draft reports, and final reports from the Fiscal Year (FY) 2018-2019. By December 31, 2019, all projects had submitted their final invoices and completed their projects. A full list of the awarded projects from FY 2018-2019 are listed in Appendix A. The Financial Status Report section of this report includes accounting from both the FY 2018-2019 and FY 2020-2021. The FY 2020-2021 biennium request for proposals and ITAC review process also took place in the second quarter.

The Request for Proposals (RFP) was sent out to individuals and institutions on the AQRP distribution list on December 2, 2019. RFP documents and guidelines were updated on the AQRP site, including an updated version of the Master Agreement that will be used for contracting between The University of Texas at Austin and the entities that are awarded project funding. The RFP deadline was set for January 15, 2020 at 5:00pm CT. Twenty-nine proposals were received and these proposals are listed in Appendix B. The AQRP Program Manager sorted and documented all submitted proposals. The proposals were distributed to the Independent Technical Advisory Committee (ITAC) on January 20, 2020 for their initial review and scoring (on a scale of 0-100, taking in to account technical merit, relevancy to priority research areas, organization's air quality research experience/key personnel, and the budget). In a conference call on February 7, 2020, proposals that scored in the bottom third in the initial ranking were each discussed by the ITAC. Based on that discussion, these proposals were not recommended for funding and were not considered for further review at the next ITAC meeting.

The ITAC met for the final review of proposals in the top two thirds of the initial scoring process on February 14, 2020 at The University of Texas at Austin – J.J. Pickle Research Campus. The ITAC scored Proposals as Highly Recommended, Recommended or Not Recommended for funding. Three proposals were rated as Highly Recommended, although all of these ratings were conditional. Proposals 20-020 and 20-025 were rated equally, but since they proposed to

perform the same task, the ITAC did not recommend funding both. The proposals differed slightly in their emphasis and deliverables and the ITAC suggested that the TCEQ differentiate between the two based on relevance to TCEQ's needs. An element of proposal 20-004, shipboard mapping of ozone concentrations in Galveston Bay and the Gulf of Mexico, was highly recommended, but the ITAC felt that the modeling and ozone sonde measurement components of this proposal could be eliminated. The ITAC recommended that the budget should be revised to reflect a reduced scope.

Fourteen proposals were Recommended for funding, however, some of these recommendations were conditional. The ITAC rank ordered these proposals, and the proposals, from highest rank to lowest in rank are: 20-003, 20-011, 20-006, 20-008 (if both proposal 20-003 and 20-008 are funded as part of a central Texas field study their measurements should be coordinated), 20-028 (this proposal was rated very highly, but the scientific merit and the ability of the investigator to perform the project is contingent on proposal 20-008 being funded), 20-005 or 20-010 (these proposals were rated equally, but since they propose to perform very similar tasks, the ITAC did not recommend funding both. The proposals differ slightly in their emphasis and deliverables and the ITAC suggested that the TCEQ differentiate between the two based on relevance to TCEQ's needs), 20-007, 20-026, 20-013, 20-027, 20-024, 20-012, and 20-014.

Twelve proposals were Not Recommended for funding. These were proposals are 20-001, 20-002, 20-009, 20-015, 20-016, 20-017, 20-018, 20-019, 20-021, 20-022, 20-023, and 20-029. The TCEQ was notified of these scored on February 18, 2020.

Program activities in the 3rd quarter will focus on continuing the review process for the proposals submitted in response to the RFP for the 2020-2021 biennium, which will include the Council Advisory rankings of proposal funding (estimated completion for April 2020), and a formal release of the final list of awarded projects for the 2020-2021 biennium (estimated for April 2020).

In the 2nd quarter, the AQR Program Manager, RoseAnna Goewey, will be on Family Medical Leave (FMLA), due to the birth of a child, which will require Center for Energy and Environmental Resources (CEER) staff to assist with the AQR basic administration duties. The AQR Program Manager plans to continue much of the work remotely, with the assistance of the AQR Director, Dr. David Allen, and CEER staff support for any in-person requirements. Due to the Program Manager's FMLA, a request was submitted on March 5, 2020 to the TCEQ for a due date extension of the second quarter report. The request was approved for a new due date of March 20, 2020.

BACKGROUND

Section 387.010 of HB 1796 (81st Legislative Session), directs the Texas Commission on Environmental Quality (TCEQ, Commission) to establish the Texas Air Quality Research Program (AQRP).

Sec. 387.010. AIR QUALITY RESEARCH. (a) The commission shall contract with a nonprofit organization or institution of higher education to establish and administer a program to support research related to air quality.

(b) The board of directors of a nonprofit organization establishing and administering the research program related to air quality under this section may not have more than 11 members, must include two persons with relevant scientific expertise to be nominated by the commission, and may not include more than four county judges selected from counties in the Houston-Galveston-Brazoria and Dallas-Fort Worth nonattainment areas. The two persons with relevant scientific expertise to be nominated by the commission may be employees or officers of the commission, provided that they do not participate in funding decisions affecting the granting of funds by the commission to a nonprofit organization on whose board they serve.

(c) The commission shall provide oversight as appropriate for grants provided under the program established under this section.

(d) A nonprofit organization or institution of higher education shall submit to the commission for approval a budget for the disposition of funds granted under the program established under this section.

(e) A nonprofit organization or institution of higher education shall be reimbursed for costs incurred in establishing and administering the research program related to air quality under this section. Reimbursable administrative costs of a nonprofit organization or institution of higher education may not exceed 10 percent of the program budget.

(f) A nonprofit organization that receives grants from the commission under this section is subject to Chapters 551 and 552, Government Code.

The University of Texas at Austin was selected by the TCEQ to administer the program. A contract for the administration of the AQRP was established between the TCEQ and the University of Texas at Austin. Consistent with the provisions in HB 1796, up to 10% of the available funding is to be used for program administration; the remainder (90%) of the available funding is to be used for research projects, individual project management activities, and meeting expenses associated with an Independent Technical Advisory Committee (ITAC).

The AQRP contract was most recently renewed for the 2020-2021 biennium and additional funding of \$750,000 per year was awarded.

RESEARCH PROJECT CYCLE

The Research Program is implemented through a 9 step cycle. The steps in the cycle are described from project concept generation to final project evaluation for a single project cycle.

- 1) The project cycle is initiated by developing (in year 1) or updating (in subsequent years) the strategic research priorities. The AQRP Director, in consultation with the ITAC, the Council and the TCEQ, develop research priorities; the research priorities are released along with a Request for Proposals.
- 2) Project proposals relevant to the research priorities are solicited. The Request for Proposals can be found at <http://aqrp.ceer.utexas.edu/>.
- 3) The Independent Technical Advisory Committee (ITAC) performs a scientific and technical evaluation of the proposals.
- 4) The project proposals and ITAC recommendations are forwarded to the TCEQ. The TCEQ evaluates the project recommendations from the ITAC and comments on the relevancy of the projects to the State's air quality research needs.
- 5) The recommendations from the ITAC and the TCEQ are presented to the Council and the Council selects the proposals to be funded. The Council also provides comments on the strategic research priorities.
- 6) All Investigators are notified of the status of their proposals, either funded, not funded, or not funded at this time, but being held for possible reconsideration if funding becomes available.
- 7) Funded projects are assigned an AQRP Project Manager at UT-Austin and a Project Liaison at TCEQ. The AQRP Project Manager is responsible for ensuring that project objectives are achieved in a timely manner and that effective communication is maintained among investigators involved in multi-institution projects. The AQRP Project Manager has responsibility for documenting progress toward project measures of success for each project. The AQRP Project Manager works with the researchers, and the TCEQ, to create an approved work plan for the project.

The AQRP Project Manager also works with the researchers, TCEQ and the Program's Quality Assurance officer to develop an approved Quality Assurance Project Plan (QAPP) for each project. The AQRP Project Manager reviews monthly, annual and final reports from the researchers and works with the researchers to address deficiencies.
- 8) The AQRP Director and the AQRP Project Manager for each project describe progress on the project in the ITAC and Council meetings dedicated to on-going project review.
- 9) The project findings are communicated through multiple mechanisms. Final reports are posted to the Program web site; research briefings are developed for the public and air quality decision makers; and a bi-annual research conference/data workshop is held.

During this reporting period, Program activity concentrated on Step 9 for the 2018-2019 projects and Steps 1-4 for the 2020-2021 biennium of the Research Project Cycle.

FINANCIAL STATUS REPORT

The AQRP contract was renewed for the FY 2018-2019 biennium and additional funding of \$750,000 per year was awarded. For the FY 2020-2021, the AQRP was renewed for additional funding of \$750,000 per year. For each year in FY 2018-2019 and FY 2020-2021, the funds were distributed across several different reporting categories as required under the contract with TCEQ. The reporting categories are listed below in detail:

Program Administration – limited to 10% of the overall funding (per Fiscal Year). This category includes all staffing, materials and supplies, and equipment needed to administer the overall AQRP. It also includes the costs for the Council meetings.

ITAC - These funds are to cover the costs, largely travel expenses, for the ITAC meetings.

Project Management – limited to 8.5% of the funds allocated for Research Projects. Each research project is assigned a Project Manager to ensure that project objectives are achieved in a timely manner and that effective communication is maintained among investigators in multi-institution projects. These funds are to support the staffing and performance of project management.

Research Projects / Contractual - These are the funds available to support the research projects that are selected for funding.

Program Administration

Program Administration includes salaries and fringe benefits for those overseeing the program as a whole, as well as materials and supplies, travel, equipment, and other expenses. This category allows indirect costs in the amount of 10% of salaries and wages.

During the second quarter, several staff members were involved, at various levels of effort, in the administration of the AQRP. Dr. David Allen, Principal Investigator and AQRP Director, is responsible for the overall administration of the AQRP. RoseAnna Goewey, AQRP Program Manager, assisted Dr. Allen in the program administration, Susan McCoy and Nohemi Cazares provided assistance with program organization as it is hosted at the Center for Energy and Environmental Resources (CEER) at The University of Texas at Austin. Denzil Smith was responsible for the AQRP Web Page development and for data management. At the close of the FY 2018-2019 Project Management accounts on 02/29/20, \$9,196.11 remained to be returned to the TCEQ. The University of Texas at Austin allows for account charge corrections up to 60 days after an account is closed. Any post-expiration account charges will be reflected in the third quarter report as well as the monthly Financial Status Reports (FSR).

Starting FY 2018-2019, fringe rates are estimated to increase by 0.5% each subsequent fiscal year. In FY 2019-2020 (09/01/2019-08/31/2020), the federally negotiated fringe rates are listed below:

Full-time, Part-Time/Benefits Eligible (including Graduate Students)	29.80%
Part-time/Non-benefits Eligible	5.10%

Table 1: Administration Budgets

**Administration Budget (includes Council expenses)
FY 2018-2019**

Budget Category	FY18 Budget	FY19 Budget	Total Budget	Expenses*	Remaining Balance
Personnel/Salary	\$53,800.00	\$53,725.22	\$107,525.22	\$103,383.09	\$4,142.13
Fringe Benefits	\$14,320.00	\$13,608.63	\$27,928.63	\$25,965.40	\$1,963.23
Travel					
Supplies	\$1,500.00	\$3,000.00	\$4,500.00	\$1,894.25	\$2,605.75
Equipment					
Other					
Contractual					
Total Direct Costs	\$69,620.00	\$70,333.85	\$139,953.85	\$131,242.74	\$8,711.11
Authorized Indirect Costs 10% of Salaries and Wages	\$5,380.00	\$5,370.00	\$10,750.00	\$10,265.00	\$485.00
Total Costs	\$75,000.00	\$75,703.85	\$150,703.85	\$141,507.74	\$9,196.11

**Expenses as of February 29, 2020*

**Administration Budget (includes Council expenses)
FY 2020-2021**

Budget Category	FY18 Budget	FY19 Budget	Total Budget	Expenses*	Remaining Balance
Personnel/Salary	\$53,700.00	\$53,700.00	\$107,400.00	\$5,763.82	\$101,636.18
Fringe Benefits	\$12,930.00	\$12,930.00	\$25,860.00	\$1,717.62	\$24,142.38
Travel					
Supplies	\$3,000.00	\$3,000.00	\$6,000.00	\$231.71	\$5,768.29
Equipment					
Other					
Contractual					
Total Direct Costs	\$69,630.00	\$69,630.00	\$139,260.00	\$7,713.15	\$131,546.85
Authorized Indirect Costs 10% of Salaries and Wages	\$5,370.00	\$5,370.00	\$10,740.00	\$576.38	\$10,163.62
Total Costs	\$75,000.00	\$75,000.00	\$150,000.00	\$8,289.53	\$141,710.47

**Expenses as of February 29, 2020*

ITAC

ITAC expenditures were incurred in FY2018-2019 and were only charges against 2018 funding. ITAC funds were not expended in 2019. Plans for ITAC funds use in FY 2020-2021 are planned for use in the second quarter.

Table 2: ITAC Budgets

ITAC Budget FY2018-2019

Budget Category	FY18 Budget	FY19 Budget	Total Budget	Expenses*	Remaining Balance
Personnel/Salary					
Fringe Benefits					
Travel	\$7,500.00	\$7,500.00	\$15,000.00	\$4,384.23	\$10,615.77
Supplies	\$1,500.00	\$1,500.00	\$3,000.00	\$284.86	\$2,715.14
Total Direct Costs	\$9,000.00	\$9,000.00	\$18,000.00	\$4,669.09	\$13,330.91
Authorized Indirect Costs <i>10% of Salaries and Wages</i>					
Total Costs	\$9,000.00	\$9,000.00	\$18,000.00	\$4,669.09	\$13,330.91

**Expenses as of February 29, 2020*

ITAC Budget FY 2020-2021

Budget Category	FY 20 Budget	FY 21 Budget	Total Budget	Expenses*	Remaining Balance
Personnel/Salary					
Fringe Benefits					
Travel	\$7,500.00	\$7,500.00	\$15,000.00	\$0.00	\$15,000.00
Supplies	\$1,500.00	\$1,500.00	\$3,000.00	\$0.00	\$3,000.00
Total Direct Costs	\$9,000.00	\$9,000.00	\$18,000.00	\$0.00	\$18,000.00
Authorized Indirect Costs <i>10% of Salaries and Wages</i>	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Costs	\$9,000.00	\$9,000.00	\$18,000.00	\$0.00	\$18,000.00

**Expenses as of February 29, 2020*

Project Management

Project Management funds in FY 2018-2019 were expended on salaries, fringe benefits, and required materials and supplies for the AQRP Program Managers and QAPP reviewer. At the close of the FY 2018-2019 Project Management accounts on 02/29/20, \$32,446.01 remaind to be returned to the TCEQ. The University of Texas at Austin allows for account charge corrections up to 60 days after an account is closed. Any post-expiration account charges will be reflected in the third quarter report as well as the monthly Financial Status Reports (FSR). Project management will be utilized in the same manner in FY 2020-2021. Program Management expenses for FY 2020-2021 are expected to begin use in the 2nd quarter.

Table 3: Project Management Budgets

Project Management Budget FY2018-2019

Budget Category	FY18 Budget	FY19 Budget	Total Budget	Expenses*	Remaining Balance
Personnel/Salary	\$37,780.06	\$38,060.00	\$75,840.06	\$55,642.15	\$20,197.91
Fringe Benefits	\$10,938.15	\$9,134.00	\$20,072.15	\$14,423.12	\$5,649.03
Supplies	\$142.50	\$1,000.00	\$1,142.50	\$142.50	\$1,000.00
Other	\$1,861.28	\$1,718.00	\$3,579.28	\$0.00	\$3,579.28
Total Direct Costs	\$50,721.99	\$49,912.00	\$100,633.99	\$70,207.77	\$30,426.22
Authorized Indirect Costs <i>10% of Salaries and Wages</i>	\$3,778.01	\$3,806.00	\$7,584.01	\$5,564.22	\$2,019.79
Total Costs	\$54,500.00	\$53,718.00	\$108,218.00	\$75,771.99	\$32,446.01

*Expenses as of February 29, 2020

Project Management Budget FY 2020-2021

Budget Category	FY 20 Budget	FY 21 Budget	Total Budget	Expenses*	Remaining Balance
Personnel/Salary	\$36,480.69	\$36,480.69	\$72,961.38	\$0.00	\$72,961.38
Fringe Benefits	\$10,871.25	\$10,871.25	\$21,742.50	\$0.00	\$21,742.50
Supplies	\$1,000.00	\$1,000.00	\$2,000.00	\$0.00	\$2,000.00
Other	\$2,500.00	\$2,500.00	\$5,000.00	\$0.00	\$5,000.00
Total Direct Costs	\$50,851.94	\$50,851.94	\$101,703.88	\$0.00	\$101,703.88
Authorized Indirect Costs <i>10% of Salaries and Wages</i>	\$3,648.06	\$3,648.06	\$7,296.12	\$0.00	\$7,296.12
Total Costs	\$54,500.00	\$54,500.00	\$109,000.00	\$0.00	\$109,000.00

*Expenses as of February 29, 2020

Research Projects

In FY 2018-2019, there were eight (8) projects requesting \$1,231,101 in funding, that were selected out of forty (40) proposals submitted to the AQRP RFP for the biennium. Table 4 on the following page shows the distribution of the projects across the fiscal years for FY 2018-2019. Projects for FY 2020-2021 have not been selected as of the second quarter. Selection of FY 2020-2021 projects is expected to be finalized late in the quarter or early in the third quarter. Future quarterly reports will reflect updated Research Project budget tables as well as an updated Appendix A with FY 2020-2021 information.

The FY 2018 – 2019 budget allocates \$1,223,000.00 for research projects (\$750,000 per fiscal year). After all FY 2016 – 2017 research projects and program activities were complete, \$7,559.39 in FY 2017 funds remained (\$1,558,35 in Research/Contractual and \$6,001.04 in Project Management). These funds were all transferred to the Research/Contractual category, and then assigned to partially fund project 19-023. These funds were expended first, so that all FY 2017 funds will be spent by Spring of 2019. That will leave a shortage of \$541.61 in Research/Contractual funding. In order to fully fund all research projects, \$782 will be transferred from the FY 2019 ITAC funds to the FY 2019 Research/Contractual category. Even though the total shortfall is \$542, the FY 2018 projects do not use all of the funds allocated to them. The AQRP is not permitted to move funds between fiscal years. Therefore, the FY 2019 shortfall is \$782.

At the close of the second quarter, all FY 2018-2019 projects have submitted their final invoices and received final payment from AQRP funds. The AQRP estimates that the final approved invoices will result in \$15,626.90 of contractual funds to be returned to the TCEQ or carried forward into the FY 2020-2021 biennium contractual funding. Table 4 and Appendix A reflect actual invoiced amounts that have been approved and paid from AQRP funds at the close of the second quarter.

Table 4: FY 2018-2019 Contractual/Research Project Budget

Contractual Expenses				
FY 18 Contractual Funding		\$611,500		
FY 18 Contractual Funding Transfers		\$0		
FY 18 Total Contractual Funding		<u>\$611,500</u>		
Project Number		Amount Awarded (Budget)	Cumulative Expenditures	Remaining Balance
18-005	UC - Irvine	\$ 139,193.00	\$ 130,718.77	\$ 8,474.23
18-005	Ramboll	\$ 28,953.00	\$ 28,950.23	\$ 2.77
18-007	Ramboll	\$ 150,000.00	\$ 150,000.00	\$ -
18-010	TAMU	\$ 121,000.00	\$ 118,019.80	\$ 2,980.20
18-022	UT Austin	\$ 85,768.00	\$ 85,766.65	\$ 1.35
18-022	Sonoma Tech, Inc.	\$ 86,346.00	\$ 86,346.00	\$ -
FY 18 Total Contractual Funding Awarded		<u>\$ 611,260.00</u>		
FY 18 Contractual Funds Expended (Init. Projects)			<u>\$ 599,801.45</u>	
FY 18 Contractual Funds Remaining to be Spent				<u>\$ 11,698.55</u>
FY 19 Contractual Funding		\$ 611,500.00		
FY 19 Contractual Funding Transfers		\$ 782.00		
FY 19 Total Contractual Funding		<u>\$ 612,282.00</u>		
Project Number		Amount Awarded (Budget)	Cumulative Expenditures	Remaining Balance
19-023	UT Austin	\$ 85,736.61	\$ 85,723.65	\$ 12.96
19-023	Ramboll	\$ 65,013.00	\$ 65,013.00	\$ -
19-025	Aerodyne Research, Inc.	\$ 199,974.00	\$ 199,722.22	\$ 251.78
19-031	Baylor University	\$ 98,087.00	\$ 97,825.82	\$ 261.18
19-031	University of Houston	\$ 33,207.00	\$ 29,804.96	\$ 3,402.04
19-040	Drexel University	\$ 130,264.00	\$ 130,264.00	\$ -
FY 19 Total Contractual Funding Awarded		<u>\$ 612,281.61</u>		
FY 19 Contractual Funding Expended (Init. Projects)			<u>\$ 608,353.65</u>	
FY 19 Contractual Funds Remaining to be Spent				<u>\$ 3,928.35</u>
Total Contractual Funding		\$ 1,223,782.00		
Total Contractual Funding Awarded		\$ 1,223,541.61		
Total Contractual Funding Remaining to be Awarded		\$ 240.39		
Total Contractual Funds Expended to Date			\$ 1,208,155.10	
Total Contractual Funds Remaining to be Spent				\$ 15,626.90

Appendix A
FY 2018-2019 Research Projects

Project No.	Project Title	Start Date	End Date	Total Project Funding Awarded	Total Project Expenditures*	Funding to be Returned to AQRP*
	<i>Lead Institution</i>	<i>Principal Investigator</i>				
18-005	Next steps for improving Texas biogenic VOC and NO emission estimates	10/31/2018	8/31/2019	\$168,146.00	\$159,669.00	\$8,477.00
	<i>University of California - Irvine</i>	<i>Alex Guenther</i>				
18-007	DDM Enhancements in CAMx: Local Chemistry Sensitivity and Deposition Sensitivity	10/16/2018	8/31/2019	\$150,000.00	\$150,000.00	\$0.00
	<i>Ramboll</i>	<i>Greg Yarwood</i>				
18-010	A synthesis study of the role of mesoscale and synoptic-scale wind on the concentrations of ozone and its precursors in Houston	10/26/2018	8/31/2019	\$121,000.00	\$118,019.80	\$2,980.20
	<i>Texas A&M University</i>	<i>Qi Ying</i>				
18-022	Development and Evaluation of the FINN v.2 Global Model Application and Fire Emissions Estimates for the Expanded Texas Air Quality Modeling Domain	9/1/2018	8/31/2019	\$172,114.00	\$172,112.65	\$1.35
	<i>The University of Texas at Austin</i>	<i>Elena McDonald-Buller</i>				
19-023	Emission Inventory Development and Projections for the Transforming Mexican Energy Sector	9/18/2018	8/31/2019	\$158,309.00	\$158,296.04	\$12.96
	<i>The University of Texas at Austin</i>	<i>Elena McDonald-Buller</i>				
19-025	Apportioning the Sources of Ozone Production during the San Antonio Field Study	10/16/2018	9/30/2019	\$199,974.00	\$199,722.22	\$251.78
	<i>Aerodyne Research, Inc.</i>	<i>Tara Yacovitch</i>				
19-031	Detecting events and seasonal trends in biomass burning plumes using black and brown carbon: (BC)2 El Paso	10/26/2018	9/30/2019	\$131,294.00	\$127,630.78	\$3,663.22
	<i>Baylor University</i>	<i>Rebecca Sheesley</i>				
19-040	Analysis of Ozone Production Data from the San Antonio Field Study	9/18/2019	9/30/2019	\$130,264.00	\$130,264.00	\$0.00
	<i>Drexel University</i>	<i>Ezra Wood</i>				

*Funding as of February 2020

Appendix B
FY 2020-2021 Submitted Proposals

Proposal #	Title	Total Budget	PI	Institution
20-001	Changing Precipitation Dynamics in Southeastern Texas over the Past Three Decades: Amount, Intensity, Duration, and Storm Type	\$ 105,845.00	Talbot, Robert	University of Houston
20-002	Measurements of Pollutant transportation into San Antonio during 2020	\$ 180,995.00	Thompson, Jon	Texas Tech University
20-003	Characterization of Corpus Christi and San Antonio Air Quality During the 2020 Ozone Season	\$ 286,427.00	Griffin, Robert	Rice University
20-004	Galveston Offshore Ozone Observation (GO3)	\$ 201,754.00	Flynn, James	University of Houston
20-005	Using Satellite Observations to Quantify Surface PM2.5 Impacts from Biomass Burning Smoke	\$ 173,692.00	Alvarado, Matthew	Atmospheric and Environmental Research, Inc. (AER)
20-006	Unprecedented Air Quality Measurements in Austin, Texas: Understanding the Sources and Formation of Ozone Particulate Matter	\$ 245,409.00	Hildebrandt Ruiz, Lea	University of Texas at Austin
20-007	Texas urban vegetation BVOC emission source inventory	\$ 130,931.00	Shah, Tejas	Ramboll US Corporation
20-008	Central Texas Air Quality: Corpus Christi, Austin, San Antonio Field Study	\$ 249,969.00	Yacovitch, Tara	Aerodyne Research, Inc.
20-009	Ozone Measurements and Platform Emission Factors in the Gulf of Mexico	\$ 12,990.00	Yacovitch, Tara	Aerodyne Research, Inc.
20-010	Using remote-sensing smoke products to quantify the impact of biomass burning smokes on ground-level particulate matter concentrations in Texas	\$ 188,322.00	Wang, Yuxuan	University of Houston
20-011	Improving Estimates of Wind-Blown Dust from Natural and Agricultural Sources	\$ 113,615.00	Emery, Chris	Ramboll US Corporation
20-012	Computationally Efficient Deep Learning Model to Improve Meteorological Models over Texas: AI-Powered Data Assimilation, Bias-Correction, and Sensitivity Analysis	\$ 175,644.00	Choi, Yunsoo	University of Houston
20-013	Deep Learning and chemical Transport Models Integration with In Situ and Remote Sensing Data to Accurately Estimate Emissions within Texas and Surrounding States	\$ 187,759.00	Choi, Yunsoo	University of Houston
20-014	Utilization of Remote Sensing Data to Improve Meteorological Fields for Air Quality Simulations	\$ 161,753.00	Pour-Biazar, Arastoo	University of Alabama at Huntsville
20-015	Baseline Air Quality Measurements in Taft, Texas, Analysis of Available Data & An Assessment of the Use of Unmanned Aerial Vehicles Using Low Cost Sensors for Selective Air Monitoring Applications	\$ 334,758.00	Torres, Vincent	University of Texas at Austin

Appendix B (Continued)

20-016	Optimized WRF Configurations for Texas Air Quality Simulations	\$ 148,745.00	Hegarty, Jennifer	Atmospheric and Environmental Research, Inc. (AER)
20-017	Novel methods for estimating particulate matter air quality impacts of smoke from biomass burning using Geostationary satellites	\$ 200,725.00	Nair, Udaysankar	University of Alabama at Huntsville
20-018	Air-quality Conscious and Cost-effective Industrial Emission Control for Texas Air-quality Improvement	\$ 201,184.00	Xu, Qiang	Lamar University
20-019	Reduced Combustion Mechanisms for the Ammonia/Natural Gas/Air System and CFD Simulations for Turbine/Internal Combustion Engine Emissions	\$ 150,000.00	Chen, Daniel H.	Lamar University
20-020	New Satellite Tools to Evaluate Emission Inventories: Is a 3-D Model Necessary?	\$ 222,667.00	Holloway, Tracy	University of Wisconsin-Madison
20-021	A critical evaluation of soil layers in land surface models for improving simulations of dust emissions	\$ 194,686.00	Wu, Yu-Ling	Earth System Science Center
20-022	Implementing Dust Speciation for Improved Representation of Dust Impacts on Chemistry	\$ 119,198.00	Liu, Xiaohong	Texas A&M University
20-023	Ozone Measurements in Galveston Bay and the Gulf of Mexico in support of air quality modeling	\$ 232,701.00	Ying, Qi	Texas A&M University
20-024	Improving biogenic emissions in urban areas and evaluating their impact on ozone and secondary organic aerosol	\$ 186,494.00	Ying, Qi	Texas A&M University
20-025	Near-Real-Time Application of Remote Sensing Tools to Verify, Validate and Improve Emissions of NO2 and SO2 for Texas Air Quality Modeling	\$ 186,979.00	Pavlovic, Nathan	Sonoma Technology, Inc.
20-026	Improve Cloud Modeled by WRF using COSP and Generative Adversarial Network	\$ 98,427.00	Lu, Zheng	Texas A&M University
20-027	Austin 2020 Air Quality Field Study	\$ 223,260.00	Walter, Paul	St. Edward's University
20-028	Quantification and Characterization of Ozone Formation in Central San Antonio	\$ 71,368.60	Wood, Ezra	Drexel University
20-029	Evaluating Opportunities to Improve County-level Emissions of Oxides of Nitrogen Using Satellite-based Observations	\$ 185,509.00	Capps, Shannon	Drexel University