AQRP Monthly Technical Report

PROJECT TITLE	**Hydrogen Cyanide for Improved Identification of Fire Plumes in the $(BC)^2$ Network**	**PROJECT #**	22-006
PROJECT PARTICIPANTS	**Dr. Tara I. Yacovitch, PI** **Dr. Rebecca Sheesley and Dr. Sascha Usenko, Co-PIs**	**DATE SUBMITTED**	1/10/2023
REPORTING PERIOD	**From:** 12/1/2022 **To:** 12/31/2022	**REPORT #**	5

A Financial Status Report (FSR) and Invoice will be submitted separately from each of the Project Participants reflecting charges for this Reporting Period. I understand that the FSR and Invoice are due to the AQRP by the 15th of the month following the reporting period shown above.

Detailed Accomplishments by Task for reporting period

The project team continues to hold regular project meetings (paused for the holidays).

On Wednesday, December 14th, 2022, a meeting was held with AQRP project management and TCEQ project liaisons to review the logistical and scientific implications of shifting the measurement period from the fall to the spring. Discussion centered on the prospect of moving the sampling location to Houston and the expected timeline for instrument repairs at Aerodyne. A separate meeting between Dr. Usenko (Baylor University) and Aerodyne personnel (Dr. Fortner - PI: AQRP 22-010, Dr. Herndon, and Mr. Daube) was held on Monday, December 19th, 2022, to weigh the benefits of changing the deployment location.

As a result of these meetings, it was determined that keeping the instrument deployment in the Dallas-Fort Worth metropolitan area would have synergistic value in the context of mobile campaign in the spring (AQRP 22-010) and ongoing expansion of the $(BC)^2$ network in the area. Houston has become a backup option in the event of further delays in preparation (electrical upgrades) of the sampling sites. Instrument repairs will proceed at Aerodyne with an emphasis on optimizing performance over rapid redeployment. Baylor University shipped the instrument back to Aerodyne on December 12th. Evaluation of the instrument has begun on-site at Aerodyne.

Site planning is continuing through the $(BC)^2$ network program, led by Dr. Usenko, and in coordination with Doug Boyer (TCEQ, for the $(BC)^2$ network project) and Vince Torres (TX AQRP, for this HCN project and the related AQRP project 22-010, PI: Dr. Fortner). The two candidate sites are the Arlington Municipal Airport site (in between Dallas and Fort-Worth, near I-20) and the Meacham Airport (Fort Worth Northwest site). Both sites require electrical upgrades to host an additional $(BC)^2$ trailer.

Meetings with the electrician and other site stakeholders continued through December, but no work was able to be scheduled that month. An installation date is expected to be determined in the next week (as of Friday, January 6th, 2023).

Preliminary Analysis

No preliminary analysis has been done in this reporting period.

Data Collected

Ambient data at Baylor University was collected. This data is not part of the project deliverables, but was used to identify an instrument issue.

Identify Any Problems or Issues Encountered and Proposed Solutions or Adjustments

Continued delays with site electrical upgrades, combined with the instrument issues identified in November have caused the measurement days from the anticipated fall campaign to be moved to the spring campaign.

The original project design included a 45 day deployment in the fall, (Sept – Oct); and a 21 day deployment in the spring (to coincide with Aerodyne mobile lab project AQRP 22-010, which is tentatively being scheduled for April). The full 66 HCN measurement days will now be allocated to this spring measurement period. We expect redeployment to occur in March when $(BC)^2$ network sites first get turned on, in advance of the April 1st $(BC)^2$ network start.

Accomplishing the science goals of this project depends on measuring biomass burning emissions in the DFW area. We still believe an extended spring campaign gives us the greatest likelihood of capturing such emissions from a variety of sources.

Goals and Anticipated Issues for the Succeeding Reporting Period

The $(BC)^2$ project continues to push for site power upgrades to occur in the next reporting period. We expect availability of the electricians in the DFW to improve after the holiday season, but delays could continue.

We will continue evaluating and begin repairing the HCN instrument at Aerodyne. Repairs are expected to be completed over the next two weeks, then the instrument will be monitored and operated in our laboratory until power at the sampling sites is installed. We expect Aerodyne engineers will diagnose and repair the HCN instrument in a timely manner, but new issues could be found upon close inspection.

Detailed Analysis of the Progress of the Task Order to Date

Measurement days originally assigned to the fall campaign have been added to the spring campaign.

Do you have any publications related to this project currently under development? If so, please provide a working title, and the journals you plan to submit to.

☐Yes ☒ No

Do you have any publications related to this project currently under review by a journal? If so, what is the working title and the journal name? Have you sent a copy of the article to your AQRP Project Manager and your TCEQ Liaison?

☐ **Yes** ☒ **No**

Do you have any bibliographic publications (ie: publications that cite the project) related to this project that have been published? If so, please list the reference information. List all items for the lifetime of the project.

☐ **Yes** ☒ **No**

Do you have any presentations related to this project currently under development? If so, please provide working title, and the conference you plan to present it (this does not include presentations for the AQRP Workshop).

☐ **Yes** ☒ **No**

Do you have any presentations related to this project that have been published? If so, please list reference information. List all items for the lifetime of the project.

☐ **Yes** ☒ **No**

Have any personnel changes occurred that were not listed in the original proposal? If so, please include a detailed description of the personnel change(s) below.

☐ **Yes** ☒ **No**

As described in the Workplan documents, and discussed directly with AQRP project management, Dr. Yacovitch will be on family leave beginning mid-December for approximately 4 months, with Conner Daube handling project management and reporting during her absence.

Are any delays expected in the progress of the research? If so, please include a detailed description of the potential delay below.

☒ **Yes** ☐ **No**

Given the ongoing delays with the electrical work at the sampling sites in the DFW, measurement days have been added to the spring campaign from the fall campaign.

Describe any possible concerns/issues (technical or non-technical) that AQRP should be made aware of.

See above sections describing the ongoing issues and project changes.

Are you anticipating using all the available funds allocated to this project by the end date? If not, why and approximately what is the amount to be returned?

☒ **Yes** ☐ **No**

Submitted to AQRP by,

Conner Daube, Interim PI