

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	4/10/2023
REPORTING PERIOD	From: 3/1/2023 To: 3/31/2023	REPORT #	8

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 update meetings on a weekly basis via telecon.

Between March 13 – 17th, the HCN TILDAS instrument was integrated into the AML and collected samples for a biomass burning experiment conducted by Stanford University at Aerodyne. This work provided an opportunity to assess the renewed performance of the instrument. Noise precision (~60 ppt) and valve operation were notably improved.

An HCN laser that had been ordered several months ago arrived at Aerodyne on March 24th. A second HCN instrument was built (using an existing chassis) and installed on the AML prior to departure to Texas for a concurrent field campaign (AQRP 22-010). Thus, the HCN instrument previously deployed for this project can be installed into the trailer as soon as it arrives in Texas with no need for use as a mobile instrument. A vibration-isolated rack provided a stable but absorbent platform during transport. While the travel to Texas went smoothly, it appears that some increase in noise occurred (~150 ppt), likely due to minor movements of the optical mirrors. After the laser temperature has stabilized for some time, hands-on alignment of the mirrors should improve performance.

Installation into the (BC)² trailer should happen by April 8th. Stationary sampling will continue until at least June 13th to fulfill the 66-day measurement period.

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

Previous 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.

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

Aerodyne expects to integrate the instrument into the trailer at Mechem Field by the first week of April. Efforts to optimize instrument performance through hands-on tuning will ideally occur while Conner Daube is in the area for another project. Coordination of consumables at the site (ultra zero air) might prove challenging and will depend on the support from Baylor University co-PIs (and associated colleagues).

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 (i.e.: 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 previous delays with the electrical work at the sampling sites in the DFW, measurement days were 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