Quarterly Report – Public Page

Date of Report: 1st quarterly Report – 1 January 2021
Contract Number: 693JK32010011POTA
Prepared for: The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (DOT-PHMSA)
Project Title: Validating Models for Predicting Gas Migration and Mitigating its Occurrence/Consequence
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For quarterly period ending: December 31, 2020

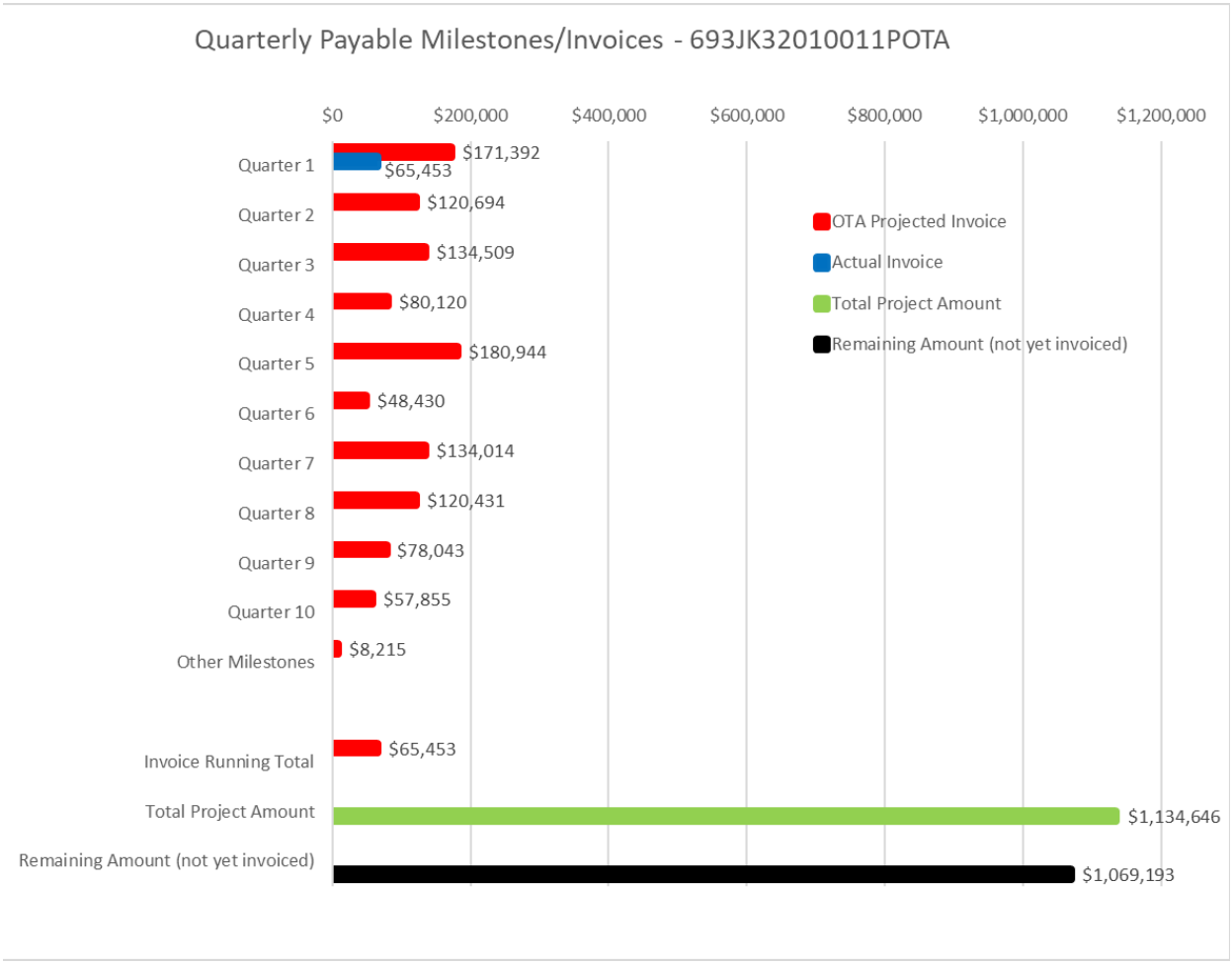
1: Items Completed During this Quarterly Period:

Item #	Task #	Activity/Deliverable	Title	Federal Cost	Cost Share
1	1	Establish a collaborative structure	Determine a collaborative study structure	64,453.40	2,000.00
3	xx	1st Quarterly Status Report	Submit 1st quarterly report	1,000.00	0.00

2: Items Not-Completed During this Quarterly Period:

Item #	Task #	Activity/Deliverable	Title	Federal Cost	Cost Share
2	3.2a	Modify test bed at METEC to accommodate gas flows up to 600 SCFH by increasing tubing sizes and installing larger flow meters	Test bed prepared for additional sensor installations (task 3.2b)	105,938.16	55,000.00

3: Project Financial Tracking During this Quarterly Period:
The below table indicates actual invoicing that will be done within the next week, and may not already be received by PHMSA.



4: Project Technical Status –

Activity 1, Task 0, Kick-off meeting

The R-PLUME (Recommended Practices for Large Underground Methane Emissions) kick-off meeting was held on the 28th of October 2020. Attendees were: Dan Zimmerle, Kate Smits, Kristine Bennett, Stuart Riddick, Clay Bell, Aidan Duggan, Younki Cho, Bo Gao, Chris McLaren, Brian Pierzina, Bob Smith

Activity 2, Task 1, Establish a collaborative structure

A working group has been put together and tasks from the proposal have been allocated:

- Dan Zimmerle – Co-PI
- Kate Smits – Co-PI
- Kristine Bennett – Project Manager
- Stuart Riddick – CSU Technical lead
- Clay Bell – CSU Research Scientist
- Aidan Duggan – CSU Research Associate
- Younki Cho -UT Arlington Postdoc
- Bo Gao – UT Arlington Postdoc

- Michelle Schwartz – UT Arlington GRA
- Fancy Cheptonui – CSU GRA
- Laurie Williams – Consultant Specialist

Also, a Technical Advisory Board has been Assembled including representation from distribution companies, regulatory agencies, and first responder groups (such as fire departments).

5: Project Schedule –

Following the "Technical and Deliverable Milestone Schedule" the project is on schedule with Task 3.2a: "Modifying the testbed" an ongoing task to be completed within 3 months of the start of the project.

Activity 5, Task 3.2a, Modify test bed at METEC to accommodate gas flows up to 600 SCFH by increasing tubing sizes and installing larger flow meters. Test bed prepared for additional sensor installations (task 3.2b).

The modification of the testbed at METEC is scheduled for completion within 3 months of the project start – i.e. 1st February 2021. The current status of this task was impacted by contract and scheduling delays at project start and general pandemic-related logistical challenges. As of this report, this task is behind the initial milestone schedule. However, substantial work has been completed to date, see list below, and the study team has decided that we need more complete input from the technical advisory board before committing to construction, in order to make the test bed as realistic as possible.

The team is moving fast to complete the test bed design which will start the contracting process for civil works with CSU's facilities department. The current target to complete modifications is 30 April 2021. We do not see this delay as having a substantial impact on the overall project schedule. However, it will require some intervention to speed settling of underground infrastructure after installation (e.g. watering key areas disturbed by construction).

Completed tasks towards installation of testbed include:

- Continued working with Bo Gao and Younki Cho of UT Arlington to model how gas flow will be affected by pipelines in the soil. Modelling results show that while gas flow local to pipeline is affected, gas farther from the infrastructure is not.
- Met with the Technical Advisory Board to discuss aims of the project and which in-ground infrastructure could realistically be simulated at METEC.
- Continued discussions with METEC staff and construction services at CSU to accomplish installation of testbeds at METEC by 1st February 2021.
- Arranged the engagement of Professor Laurie Williams (Fort Lewis College, CO) between December 2020 and February 2021. Professor Williams is a consulting expert on first responder and gas companies' recommended practices when locating and classifying sub-surface gas leaks.
- The selection and automation of a subsurface methane sensor, capable of measuring concentrations between 0 ppm and 100%.
- Design of the testbed capable of delivering 600 SCFH to an emission point 4 feet below the surface has been agreed by the Technical Advisory Board.
- Sensors have been selected for continuous, below-ground, measurements. An installation method and housing has been designed and is being prototyped. These sensors can be inserted and removed from sampling pipes, allowing the sensor system to be moved between test bed locations.