

Internal Quarterly Report

Date of Report: 4th Quarterly Report – September 30, 2022

Contract Number: #693JK3211RA0001

Prepared for: PHMSA DOT

Project Title: Assessment of Nondestructive Examination (NDE) and Condition Monitoring Technologies for Defect Detection in Non-Metallic Pipe

Prepared by: EWI

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For quarterly period ending: September 30, 2022

1: Items Completed During this Quarterly Period:

The fourth quarterly update was completed during Quarter four.

Item #	Task #	Activity/Deliverable	Title	Federal Cost	Cost Share
9	10	Submit 4 th Quarterly Report	4 th Quarterly Status Report & Quarterly collaboration meeting	\$89,299.50	0.00

2: Items Not Completed During this Quarterly Period:

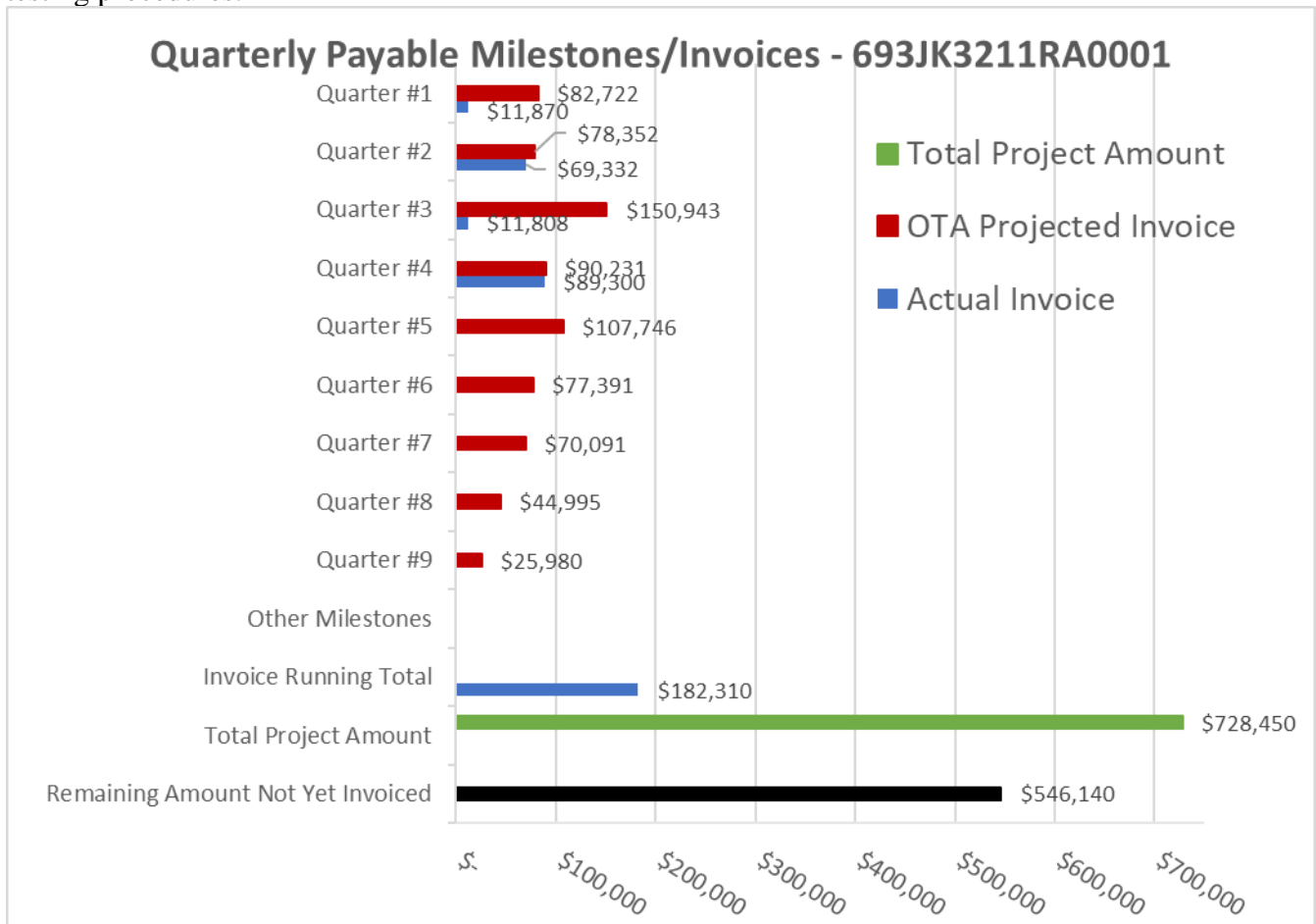
The NMP Sample matrix had been internally completed, however we received additional pipes June 20th and June 24th, those pipe details were added to the matrix. The pipes were sent off to CT scan in the last quarter and results will be used to determine further testing plans. EWI has drafted the NDE procedures for all the internal methodologies and has requested quotes a second time from vendors for NDE methodologies we will be hiring out. Those POs need to be finalized before we receive their procedure paperwork. These will be evaluated and added to our procedures before submission.

Item #	Task #	Activity/Deliverable	Title	Federal Cost	Cost Share
3*	2	NMP sample matrix detailing type of pipe and defects, anomalies or damage per sample	Prepare detailed matrix of NMP samples	\$30,540.73	\$66,782.84
4*	3	Develop NDE procedures for inspection of NMP samples using non-contact and 3 coupled UT methods, microwave inspection method and 2 thermography methods	Completion of written NDE procedures	\$49,331	\$20,310

3: Project Financial Tracking During this Quarterly Period:

The actual spend is behind planned.

- Task 2 – As of 6/24/2022 EWI has all the pipes from current project partners and has updated the Matrix to include these later arrivals. These pipes are currently in Buffalo New York where they were CT scanned.
- Task 3 – EWI has drafted NDE procedures. Our requests for quote for Microwave Imaging and Air Coupled UT were sent in April, after addressing several questions we received multiple no bids and what bids we did receive were six times larger than the bids these same companies provided during our 2021 proposal process. EWI has done their due diligence to reach back out to companies who have now agreed to bid and are awaiting quotations back. Once purchase orders are provided to the vendors, EWI will finalize procedures including both internal NDE testing procedures.



4: Project Technical Status –

Item	Task	Activity/Deliverable	Title
1	10	Submit 1st quarterly report	1st Quarterly Status Report & Quarterly collaboration meeting
2	1	Task report summarizing findings of literature review	Literature review of recent research on NDE of polymers & composites - issue task report
3*	2	NMP sample matrix detailing type of pipe and defects, anomalies, or damage per sample	Prepare detailed matrix of NMP samples
4*	3	Develop NDE procedures for inspection of NMP samples using non-contact and 3 coupled UT methods, microwave inspection method and 2 thermography methods	Completion of written NDE procedures
5	10	Submit 2 nd Quarterly Report	2 nd Quarterly Status Report & Quarterly collaboration meeting
6	6	Task 6 Test Procedures and Chamber Assembly	Prepare & Provide a Written Test Procedure for Erosion Tests
7	4	NDE Review Progress to date (samples, procedures, early inspection data)	Task 4 NDE Project Review
8	10	Submit 3 rd quarterly report	3 rd Quarterly Status Report & Quarterly collaboration meeting
9	10	4 th Quarterly Status Report	4 th Quarterly Status Report & Quarterly collaboration meeting
10	6	Perform inner linear erosion tests & assess NDE detection	Task report summarizing erosion test procedure and results, and NDE inspection results
28	10	Annual Review	Review Meeting (virtual)

Task 1 – Literature Review was completed by EWI and NDE4zero’s Mark Lozev. The report was supplied to the project team on 3/31/2022

Task 2 – NMP Sample Matrix. EWI received additional pipes in late June and is further updating the Matrix pending CT results.

Task 3 – The internal NDE procedures have been developed. NDE procedures for external technologies is awaiting procurement activities.

Task 4 – CT scanning was completed in mid-June on pipe samples that had been received by the project. New pipe samples were received late June and are getting scanned now (9/30/2022). After scans are analyzed EWI NDE testing will begin on selected pipe samples from this batch of material. The NDE testing, and analysis is underway, initial data and images were shared at the Q4 meeting on 9/21/22. Testing will continue for several months with EWI completing multiple forms of NDE and then sending pipe to subcontracts for additional methods (air coupled UT and Microwave).

Task 6 – The cost share portion of this task has been completed (Item #6 Task 6): test cells have been built and a test method developed (5/31/2022). The task began in December 2021 and has been completed in June 2022. The federally funded portion of this work began in August 2022. Tests are currently being run and will be billed under item #10 Task 6. The weeklong erosion trial has ended and EWI found that the sand polished the internal diameter of the pipe, the sharp leading edges of the impeller were dulled, so its lifetime may only be several months before replacement is necessary, and finally the sand did not stay suspended well in the water. It was found to be mostly packed on the

