



#### **4<sup>TH</sup> QUARTERLY REPORT**

DOT Project Number: 729 (GTI 22428)

DOT Contract Number: 693JK31810003

OTD Project Number: 4.14.c.2 (GTI 22429)

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# **Validating Non-Destructive Tools for Surface to Bulk Correlations of Yield Strength, Toughness, and Chemistry**

#### **Reporting Period**

May 1, 2019 through July 31, 2019

#### **Report Issued**

July 31, 2019

#### **Prepared For**

U.S. Department of Transportation Pipeline and Hazardous  
Materials Safety Administration (DOT/PHMSA)

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## Project Objectives

The deliverables of this project will facilitate the use of non-destructive surface testing: micro-indentation, micro-machining, in situ chemistry, and replicate microscopy analysis as accurate, efficient, and cost-effective tools for material property confirmation.

This work will provide benefits to pipeline safety, energy continuity, and integrity assessment programs since the developed techniques and models and validated testing technology will not require a line to be taken out of service or destructively cut out samples from the in-service pipeline.

The results of this project will also be applicable to pending DOT/PHMSA regulations that require operators to backfill their material property records for grandfathered pipeline segments and/or those that do not have adequate material records.

## Completed Work this Quarter

1. Completed NDE (filed-based technology) testing on project pipeline samples.
2. Continued lab (destructive) testing of project pipeline samples.
3. Developed plan to facilitate accelerated model analysis of test data sets.
4. Completed initial non-linear model analysis using Bayesian Model Averaging.
5. Conducted on site meeting at GTI HQ Labs with DOT/PHMSA AOR.
6. Completed the project's first annual DOT/PHMSA Peer Review.

## Planned Work for Next Quarter

1. Continue bulk benchmark/lab testing of samples for mechanical and physical properties.
2. Receive remaining NDE testing reports and data.
3. Continue model development.

**End of Quarterly Update**