



# Results of Pipeline Study – Phase II

*Leak Detection System Pilot Demonstration*

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John Harju  
VP for Strategic Partnerships

# Project Prescribed by HB 1358

- Project is focused on conducting analysis of crude oil and produced water (gathering) pipelines
  - Phase I – Study
    - ◆ Analyze the existing regulations on construction and monitoring of crude oil and produced water pipelines
    - ◆ Determine the feasibility and cost-effectiveness of requiring leak detection and monitoring technology on new and existing pipeline systems
    - ◆ Provided a report with recommendations to NDIC and EDTC December 1, 2015.
  - Phase II – Demonstration
    - ◆ Conduct pilot project to evaluate a pipeline leak detection and monitoring system.

# Leak Detection Demonstration Pilot Project

- Currently formulating detailed demonstration plans with four industry partners
- Field demonstration will commence with one industry partner this week
- Intend to demonstrate:
  - System Control and Data Acquisition (SCADA) vs. Computational Pipeline Monitoring (CPM)
  - Pressurized vs. unpressurized operation
  - Steady-state vs. variable operating conditions
  - Oil and brine operations
  - Various pipeline materials
  - Various LDS approaches
- Anticipated results
  - Monitor and analyze performance
    - ◆ Controlled, simulated spills
    - ◆ Measure response time
    - ◆ Determine leak threshold
    - ◆ Quantify false alarms
    - ◆ Quantify relative costs
  - Report to EDTC and NDIC on results

# Demonstration Participants

- Four pipeline operators
  - Two producers
  - Two service providers
- One CPM vendor who will operate a shadow system in parallel to one of the pipeline operators
- One pipeline material provider who claims that an annular space within the pipeline wall can be used to achieve leak detection functionality. This material is employed by one of the pipeline operators.
- Possibility for other leak detection technology providers to offer products for demonstration to one of the pipeline operators with whom the EERC is still defining the scope of work.
  - UAS monitoring
  - Negative pressure wave technology
  - External detection technology

# Pipeline Demonstration Overview

Partner	Partner Status	Sector	Fluid Carried	Pipeline Material	Leak Detection Technology
A	Existing	Oil producer	Produced water	Fiberglass	In-house computational modeling (CPM)
B	Existing	Pipeline operator	Produced water	High-density polyethylene	In-house CPM vs. third-party CPM
C	Existing	Oil producer	Crude oil	Steel	TBD (multiple technologies being considered)
D	Proposed	Pipeline operator	Produced water	Composite	In-house CPM + annular space leak detection

# Preliminary Test Plan

- Joint EERC–Partner Test Plan
  - Internal technologies and SCADA/CPM
    - ◆ Simulate leaks at three unique flow rates at a specified location by opening a valve and draining fluid to tanker truck.
      - Slow rate change tests
      - “Burst” simulation with quick-open ball valve
    - ◆ Observe system response ... does system detect “leaks” at various “leak” rates?
    - ◆ Repeat at alternate location on same pipeline system.
    - ◆ Methods derived from similar, extensively reported TransCanada and Enbridge tests and API methods
  - External technologies
    - ◆ Simulate leaks in specific, controlled, confined zones of soil where remediation is accomplished by scoop-and-haul of a small amount of affected soil.

# Preliminary Analysis Plan

- EERC analysis plan
  - Collect field flow data from EERC fluid withdrawal measurement cart.
  - Collect partner SCADA data from partner control center.
  - Collect parallel CPM data from CPM vendor.
  - Compare detection limits and false alarm rates from SCADA and CPM.
  - Compare costs of various leak detection technologies.

# Project Schedule – Phase II

- Field demonstration with Partner A begins this week.
- Remainder of tests will be completed prior to end of August.
- Analysis continues through October.
- Draft report to EDTC and NDIC by November 30, 2016.
- Final report to legislature by December 31, 2016, in time for beginning of ND Legislative Session.

# CONTACT INFORMATION

## Energy & Environmental Research Center

University of North Dakota

15 North 23rd Street, Stop 9018

Grand Forks, ND 58202-9018

World Wide Web: [www.undeerc.org](http://www.undeerc.org)

Telephone No. (701) 777-5157

Fax No. (701) 777-5181

**John Harju,**

*VP for Strategic Partnerships*

[jharju@undeerc.org](mailto:jharju@undeerc.org)



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