Results of Pipeline Spills Statistical Study

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Project Prescribed by HB 1358

• Project is focused on conducting analysis of crude oil and produced water gathering pipelines.
  – Phase I – Study
    ♦ Analyze existing regulations on construction and monitoring of crude oil and produced water gathering pipelines.
    ♦ Determine the feasibility and cost-effectiveness of requiring leak detection and monitoring technology on new and existing pipeline systems.
    ♦ Provide 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.
Stakeholder Input

Industry

(Ombudsman Program)

Office of the Governor

Critical Challenges. Practical Solutions.
Context Is Important!
Gathering Pipelines – A Complex Web

ND Gathering Pipeline Map

**This Represents Less Than 20% of Gathering Lines Installed**

Detail on a 3-mile x 4-mile Section
Overview of Produced Fluid Transport

Study Focus: Pipelines that transport liquids from a wellsite to aggregation points such as a crude oil refinery or pipeline terminal or water treatment/disposal sites.
Context on Gathering Pipelines

Oil Gathering in ND

- Petroleum product must get to market:
  - Large Truck Fleets
  - Extensive Pipeline Networks

- Pipelines are considered safer, more environmentally friendly, and vastly more economical.
Understanding Spill Statistics and Comparisons Against Other States
Superficial Reporting on Pipeline Spills

**Incidents**

**Volume**

![Graph showing increase in spill incidents and volume over years](image-url)
Large Spills Skew Perceptions

2013 includes two large spills: 20,600 bbl oil and 17,000 bbl saltwater.
2014 includes one large spill: 24,000 bbl saltwater.
Pipeline Spills – A Fraction of All Spills

Incidents 2001–2007

- Pipeline Leak: 39%
- Tank Overflow: 13%
- Tank Leak: 8%
- Pump Leak: 6%
- Treater Leak: 7%
- Other: 5%
- Valve/Piping Connection Leak: 10%
- Blowout, Fire, Stuffing Box Leak, Treater Pop-Off, Truck Overflow, Undertermined, Vehicle Accident, Vessel Leak, Wellhead Leak: 12%

Incidents 2008–2014

- Pipeline Leak: 16%
- Tank Overflow: 13%
- Tank Leak: 6%
- Pump Leak: 3%
- Treater Leak: 6%
- Other: 17%
- Valve/Piping Connection Leak: 10%
- Blowout, Fire, Stuffing Box Leak, Treater Pop-Off, Truck Overflow, Undertermined, Vehicle Accident, Vessel Leak, Wellhead Leak: 12%
Pipeline Spills – A Fraction of All Spills

Volumes 2001–2007

- Pipeline Leak: 42%
- Tank Overflow: 12%
- Tank Leak: 12%
- Pump Leak: 9%
- Other: 5%
- Treater Leak: 5%
- Valve/Piping Connection Leak: 8%
- Blowout, Fire, Stuffing Box Leak, Treater Pop-Off, Truck Overflow, Undetermined, Vehicle Accident, Vessel Leak, Wellhead Leak: 7%

Volumes 2008–2014

- Pipeline Leak: 20%
- Pump Leak: 1%
- Tank Overflow: 10%
- Tank Leak: 8%
- Other: 24%
- Valve/Piping Connection Leak: 20%
- Blowout, Fire, Stuffing Box Leak, Treater Pop-Off, Truck Overflow, Undetermined, Vehicle Accident, Vessel Leak, Wellhead Leak: 14%
Oil Spills Normalized by Production

Oil Spill Volume, bbl/Oil Production, MMbbl

- Alaska
- California
- North Dakota
- New Mexico
- Texas
- Colorado

Barrels Spilled per Million Barrels Produced


Oil Production Volume, MMbbl

- Alaska
- California
- North Dakota
- New Mexico
- Texas
- Oklahoma
- Colorado

Millions of Barrels Produced

Brine Spills Normalized by Production

Normalized Brine Spill Volume, bbl/MMBOE

- Alaska
- California
- North Dakota
- New Mexico
- Colorado

Volume Spilled, bbl/MMBOE

2008 2009 2010 2011 2012 2013 2014

Oil Production Volume, MMbbl

- Alaska
- California
- North Dakota
- New Mexico
- Texas
- Oklahoma
- Colorado

Millions of Barrels Produced

2008 2009 2010 2011 2012 2013 2014
Pipeline Spills Compared to Total Spills

**Graph 1:**
- **X-axis:** Year (2001 to 2014)
- **Y-axis:** Spill Incidents, no.
- **Legend:**
  - Orange: Pipeline-Related Spills
  - Blue: Total Spills

**Graph 2:**
- **X-axis:** Year (2001 to 2014)
- **Y-axis:** Spill Volume, bbl
- **Legend:**
  - Orange: Pipeline-Related Spill Volume
  - Blue: Total Spill Volume
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