



Energy & Environmental Research Center

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July 30, 2020

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
State Capitol, 14th Floor
600 East Boulevard Avenue, Department 405
Bismarck, ND 58505-0840

Dear Ms. Fine:

Subject: Quarterly Progress Report Entitled "iPIPE – intelligent Pipeline Integrity Program"
Contract No. G-046-88; UND Project – Fund 43500-UND0022445
EERC Funds 23121, 23211, and 24817

Attached is a quarterly progress report on the subject project for the period of
April 1, 2020 – June 30, 2020.

If you have any questions, please contact me by phone at (701) 777-5260 or by e-mail at
jalmlie@undeerc.org.

Sincerely,

DocuSigned by:
A blue ink signature of Jay C. Almlie, written in a cursive style.
88D36B9C56364E7...

Jay C. Almlie
Principal Engineer
Mid/Downstream Oil & Gas Group Lead

JCA/rlo

Attachment



iPIPE – iNTELLIGENT PIPELINE INTEGRITY PROGRAM

Quarterly Progress Report

(for the period of April 1, 2020 – June 30, 2020)

Prepared for:

Karlene Fine

North Dakota Industrial Commission
State Capitol, 14th Floor
600 East Boulevard Avenue, Department 405
Bismarck, ND 58505-0840

Contract No. G-046-88

Prepared by:

Jay C. Almlie

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July 2020

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iPIPE – INTELLIGENT PIPELINE INTEGRITY PROGRAM
Quarterly Progress Report
April 1, 2020 – June 30, 2020

EXECUTIVE SUMMARY

This document is a quarterly report on the North Dakota Industrial Commission (NDIC)-funded intelligent Pipeline Integrity Program (iPIPE), managed by the Energy & Environmental Research Center (EERC). The goal of iPIPE is to develop and demonstrate cutting-edge technology that can prevent and/or detect gathering pipeline leaks. This goal is supported by accomplishment of the following objectives:

- Select the most promising emerging (near-commercial) technologies for demonstration.
- Assist technology providers in refinement of their products.
- Demonstrate multiple technologies on working gathering pipelines.
- Document results of technology demonstrations.
- Facilitate adoption of technologies into North Dakota pipeline operations.

During this reporting period, the program achieved the following highlights:

- In May, the program held a virtual open house to provide potential new program members deeper insight into how the program operates. During this online meeting, members shared with interested parties benefits derived from participation and reflections on advancements achieved through the program.
- In May, the program held a kickoff meeting between iPIPE members and the team at Orbital Sidekick (OSK) to align everyone's expectations on the OSK project.
- In June, the program completed the first portion of the scope of work for the Satelitycs project, which included 16 weeks of satellite data capture and alert processing.
- In June, the program released its fourth request for proposals (RFPs), seeking emerging technologies for selection for development activities in 2021.

The EERC holds an unwavering commitment to the health and well-being of its employees, partners and clients, and the global community. As such, precautionary measures have been implemented in response to COVID-19. Staff continue to carry out project-related activities remotely, and personnel supporting essential on-site laboratory and testing activities are proceeding under firm safety guidelines. Travel has been minimized, and protective measures are being undertaken for those who are required to travel. At this time, work conducted by EERC employees is anticipated to progress with minimal disruption. Challenges posed by economic variability will be met with open discussion between the EERC and project partners to identify solutions. The EERC is monitoring developments across the nation and abroad to minimize risks, achieve project goals, and ensure the success of our partners and clients. In the event that any potential impacts to reporting, scope of work, schedule or cost are identified, they will be discussed and addressed in cooperation with the project partners.

iPIPE – INTELLIGENT PIPELINE INTEGRITY PROGRAM
Quarterly Progress Report
January 1, 2020 – March 31, 2020

BACKGROUND

During a May 2017 meeting with North Dakota pipeline operators, Governor Doug Burgum challenged industry to apply advanced technologies to eliminate pipeline leaks in North Dakota. In response to the Governor's challenge, industry chose a proactive path and engaged in a 3½-year program to advance development and application of emerging technologies that will prevent and detect pipeline leaks. The North Dakota Industrial Commission (NDIC)-funded intelligent Pipeline Integrity Program (iPIPE) intends to assist in the development of multiple emerging technologies to prevent and detect pipeline leaks by engaging with technology providers to refine not-yet-commercial products specifically for buried gathering pipelines in North Dakota and then demonstrate technology application on working gathering pipelines.

The goal of this project is to develop and demonstrate cutting-edge technology that can prevent and/or detect gathering pipeline leaks. This goal is supported by accomplishment of the following objectives:

- Select the most promising emerging (near-commercial) technologies for demonstration.
- Assist technology providers in refinement of their products.
- Demonstrate multiple technologies on working gathering pipelines.
- Document results of technology demonstrations.
- Facilitate adoption of technologies into North Dakota pipeline operations.

Multiple demonstrations of emerging technologies on working pipelines will simultaneously assist technology providers in refining designs, pave a path toward full commercialization in the North Dakota market, prepare pipeline operators for adoption of the new tools, and improve the performance and economics of gathering pipeline operations in North Dakota. With demonstrated success, additional consortium members (pipeline operators) will join the effort, thus enabling field testing of more technologies and further proliferating new technology among all pipeline operators.

Members of the industry-led consortium include Dakota Access Pipeline, DCP Midstream, Enbridge, Equinor, Goodnight Midstream, Hess Corporation, Marathon Petroleum, Oasis Midstream Partners, ONEOK, and TC Energy. The Energy & Environmental Research Center (EERC) has contracted with NDIC and the industrial partners to manage the program. As such, the EERC submits a quarterly report and an annual report to provide updates to NDIC on the progress of the iPIPE consortium.

The following quarterly report summarizes program activities from April 1, 2020, through June 30, 2020.

ACCOMPLISHMENTS DURING REPORTING PERIOD

As the oil and gas industry reeled from a double challenge of pandemic-related decrease in demand and marketing challenges related to the Russia–Saudi Arabia price war, iPIPE’s Executive Committee made a conscious and purposeful decision to slow program promotion. Scheduled technology development activities were executed as scheduled, but aggressive outreach and new member recruitment efforts were slowed.

- Program-level activities
 - Program briefings
 - ♦ On April 7, 2020, iPIPE’s program manager presented an overview of iPIPE to Colonial Pipeline. The goal of the discussion was to explore possible membership in iPIPE.
 - ♦ On April 15, 2020, iPIPE’s program manager presented an overview of iPIPE to the Pipeline Open Data Standard’s (PODS) executive director. The goal of the discussion was to explore common interests in technology and strategy.
 - ♦ On May 20, 2020, iPIPE members and the EERC hosted a virtual open house for the program. The goal of this 3-hr meeting was to raise awareness of the program across a broad swath of industry insiders. The morning session enjoyed participation of 35 individuals from the following companies: Aera Energy, Alta Gas, BP, Chevron, ConocoPhillips, Crestwood, Kinder Morgan, NextEra Energy, Phillips 66, Plains All-American Pipeline, Shell, Southwestern Energy, Targa Resources, True Companies, Washington Gas, and WBI Energy.
 - ♦ On May 27, 2020, iPIPE’s program manager presented an introduction to iPIPE to key staff at Targa Resources. The goal of the discussion was to explore possible Targa membership in iPIPE.
 - ♦ On June 11, 2020, iPIPE’s program manager presented an introduction to iPIPE to the Young Pipeline Professionals (YPP) group. The goal of the discussion was to raise awareness of iPIPE among industry insiders.
 - Strategic alliances
 - ♦ On April 17, 2020, and April 21, 2020, iPIPE’s program manager explored common interests and possible strategic alliance with the executive director of PODS.
 - Program meetings
 - ♦ On April 6, 2020, iPIPE’s Executive Committee met to determine program course and strategy in light of anticipated, prolonged industry slowdown due to COVID-19 and the Russia–Saudi Arabia oil price war.
 - ♦ On April 13, 2020, May 11, 2020, and June 8, 2020, iPIPE held monthly member meetings to update all members on program status. The goal of these meetings is to keep members apprised on a variety of program topics, including recruitment, finances, strategic direction, and technology development project status.
 - Member recruitment
 - ♦ The program continued discussion with a number of companies regarding membership in the consortium. Some of these companies have approached the program regarding membership requirements and benefits, while others have been approached by the program and/or existing consortium members.
 - Program media mentions
 - ♦ iPIPE has now been highlighted in more than 80 public multimedia and printed articles. A partial listing of known media mentions is provided in Appendix A.

- Technology selection
 - During this reporting period, the EERC continued its worldwide search for companies offering emerging technologies (not yet commercial) to improve gathering pipeline leak detection and gathering pipeline leak prevention. A wide range of technologies is continuously investigated, explored, and considered. These technologies include a vast spectrum of unique approaches such as direct measurement technologies, remote sensing technologies, nanotechnology sensors, self-healing technologies, multisensor fusion technologies, advanced cathodic protection technologies, and miniaturized inline inspection technologies. This reporting period yielded an unprecedented number of inquiries from technology providers, demonstrating that this program is highlighting an industry need that was previously poorly understood by technology providers.
 - On June 12, 2020, iPIPE released its latest request for proposals (RFPs). Proposals from interested technology providers are due on September 4, 2020. To date, the program has sent the RFP to nearly 120 interested technology providers.
- Demonstration execution – Satelytics Phase III
 - Weekly status updates on the Satelytics Phase III project were held with wide iPIPE member participation throughout this reporting period. The goal of these weekly updates was to inform iPIPE membership on alerts generated by the Satelytics algorithms each week, discuss functionality aspects and desired improvements, and provide valuable performance-refining feedback to Satelytics.
 - Satelytics completed its planned 16-week satellite data capture campaign over North Dakota and New Mexico during this reporting period. The project will now begin the second portion of the scope of work: methane monitoring.
- Demonstration execution – Orbital Sidekick (OSK)
 - Throughout this reporting period, iPIPE continued to negotiate a contract with OSK. Progress toward an executed contract has been made, but the contract has not yet been signed.
- Demonstration execution – Direct-C
 - During this reporting period, Direct-C continued to experience communication challenges with many of its iPIPE field installations in western North Dakota. At the end of the reporting period, new hardware was installed. Some new hardware has yet to be installed. Logistical challenges imposed by the coronavirus pandemic have delayed a complete resolution to these issues.

MEMBERSHIP AND FINANCIAL INFORMATION

The original budget proposed to the NDIC Oil and Gas Research Program (OGRP) totaled \$3,714,000, as shown in Table 1. To demonstrate additional resources provided by new members, additional financial commitment from NDIC, and significantly increased in-kind cost share provided by technology providers and program members, an updated budget is presented in Table 2. Table 2 demonstrates the rapid growth of this program. Table 3 presents greater detail on expected budget and actual expenses incurred by the program to date.

Table 1. iPIPE Original Budget

Sponsors	2018	2019	2020	2021	Total
NDIC – Cash	\$403,320	\$405,226	\$393,454	\$398,000	\$1,600,000
Industry – Cash	\$264,000	\$450,000	\$450,000	\$450,000	\$1,614,000
Industry and Technology Provider – In-Kind	\$125,000	\$125,000	\$125,000	\$125,000	\$500,000
Total	\$792,320	\$980,226	\$968,454	\$973,000	\$3,714,000

Table 2. iPIPE Updated Budget

Sponsors	2018	2019	2020	2021	Total
NDIC – Cash	\$403,320	\$405,226	\$893,454	\$898,000	\$2,600,000
Industry – Cash	\$352,000*	\$700,000*	\$850,000	\$750,000	\$2,652,000
Industry and Technology Provider – In-Kind	\$525,878*	\$925,719*	\$1,500,000	\$500,000	\$3,451,597
Total	\$1,281,198	\$2,030,945	\$3,243,454	\$2,148,000	\$8,703,597

* Reflects actuals for these years.

Table 3. iPIPE Expected Budget and Expenses to Date

Sponsors	Expected Budget	Actual Expenses as of 6/30/20	Balance Remaining of Expected Budget
NDIC Share – Cash	\$2,600,000	\$1,418,479	\$1,181,521
Industry Share – Cash	\$2,652,000	\$1,819,945	\$832,055
Industry – In-Kind	\$375,000	<i>DCP</i> \$46,800 <i>Enbridge</i> \$96,153 <i>Equinor</i> \$152,480 <i>Goodnight</i> \$18,720 <i>Hess</i> \$160,945 <i>MPLx</i> \$17,936 <i>Oasis</i> \$33,253 <i>ONEOK</i> \$5,000 <i>Whiting</i> \$9,042 TOTAL \$540,329	\$0
Technology Providers – In- Kind	\$3,076,597*	<i>Satellytics</i> \$1,230,350 <i>Direct-C</i> \$168,818 <i>Ingu</i> \$88,266 TOTAL \$1,487,434	\$1,589,163
Total	\$8,703,597*	\$5,007,387	\$3,602,739**

* Includes budget estimates from proposals for 2020 technology development projects and an estimate of anticipated 2021 in-kind from as-yet-unknown technology providers.

** This amount does not include industry in-kind contributions provided in excess of the expected budget.

The program continues to solicit additional members to contribute to this program. As additional members join the program, Tables 2 and 3 will be updated to show the additional financial resources brought to the program.

Project progress, as represented by the project schedule presented in the original NDIC OGRP proposal, is shown in Figure 1.

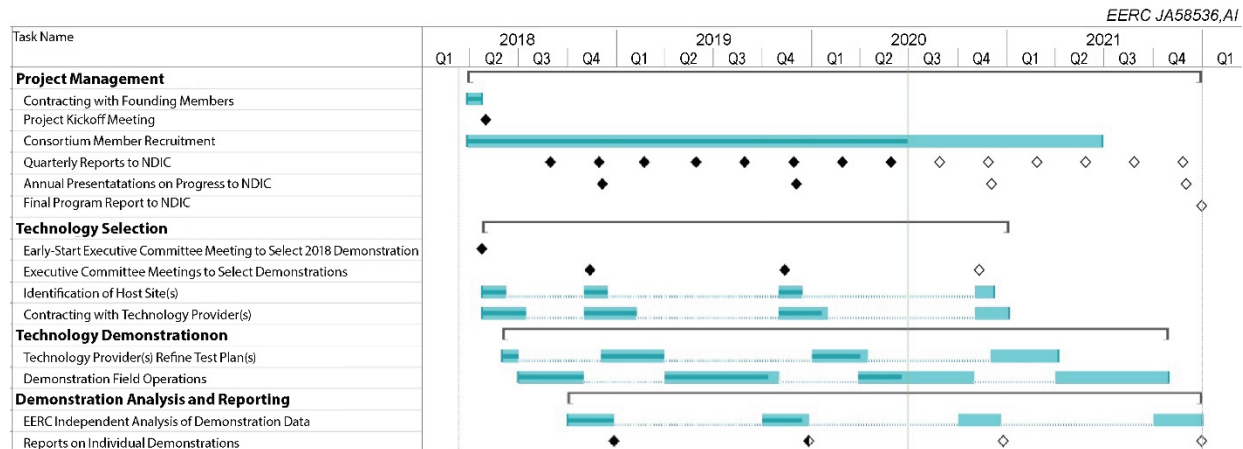


Figure 1. Project progress.

FUTURE ACTIVITIES

The planned activities for the next quarter are detailed below:

- Program-level activities
 - iPIPE will continue ongoing and new discussions with potential new program members during the coming reporting period.
- Technology selection
 - The EERC will continue to research and evaluate potential new and emerging technologies for consideration by iPIPE. The EERC will contact several potential candidates for the next technology selection event and will solicit proposals from select technology providers. This is a continuous task that will continue until the next iPIPE technology selection event, anticipated in October 2020.
 - The program expects to receive 12–24 proposals by September 4, 2020. The EERC will downselect to a subset of these, choosing the best proposals for the iPIPE Technology Selection Committee to review in preparation for the technology selection event in October 2020.
- Demonstration execution – Satelytics, Phase III
 - Satelytics will begin methane emissions monitoring over a 100-km² area of interest in western North Dakota during the coming quarter. This work will include satellite

short-wave infrared data capture, hyperspectral data capture from crewed aircraft flyovers, possible data capture from drones (if a suitable drone provider can be contracted by Satelytics) and, possibly, data capture from stratospheric balloon.

- Demonstration execution – OSK
 - The EERC expects to complete contracting with OSK for 2020 work.
 - Upon completion of contracting, the program anticipates engagement on initial data exchange between OSK and iPIPE members to facilitate early tasks in the scope of work.
- Demonstration execution – Direct-C
 - Direct-C will complete planned activities during the coming quarter and will provide reporting on its performance.
 - At undisclosed times, the EERC may trigger small, simulated pipeline spills near installed sensors to challenge the sensors. These simulated spills have been tightly coordinated with the environmental compliance teams of the volunteer pipeline operators upon whose pipelines these sensors have been installed. No environmental risk has been identified.
 - The EERC will complete an evaluation report on the Direct-C project.



APPENDIX A

PARTIAL LISTING OF iPIPE MEDIA MENTIONS

Partial List of Articles Highlighting iPIPE:

Updated June 30, 2020

Title	Date	URL
Industry Responds to Governor's Initiative to Improve Pipeline Technology; Program Funding Approved by North Dakota Industrial Commission		https://www.ndoil.org/industry-responds-to-governors-initiative-to-improve-pipeline-technology-program-funding-approved-by-north-dakota-industrial-commission/
Satelytics Selected to Participate in the intelligent Pipeline Integrity Program (iPIPE)	5/18/2018	https://mailchi.mp/satelytics/satelytics-chosen-to-participate-in-iPIPE-project?e=922473135e
ND Implements Intelligent Pipeline Project	5/22/2018	http://northamericanshalemagazine.com/articles/2380/nd-implements-intelligent-pipeline-project
North Dakota Governor Doug Burgum Provides Remarks This Morning at the Williston Basin Petroleum Conference in Bismarck, Thanks Hess and the Industry for Innovation Through iPIPE Program.	5/23/2018	https://twitter.com/HessCorporation/statuses/999315208261853185
North Dakota Pipeline Leak Detection Initiative Announced	5/25/2018	https://extension.psu.edu/north-dakota-pipeline-leak-detection-initiative-announced
New Consortium Sets Goal of Improving Pipelines	5/26/2018	https://www.mrt.com/business/oil/article/New-consortium-sets-goal-of-improving-pipelines-12941971.php
Industry Responds to Governor's Initiative to Improve Pipeline Technology; Program Funding Approved by North Dakota Industrial Commission	5/26/2018	https://www.oilandgasonline.com/doc/industry-governors-initiative-pipeline-program-north-dakota-industrial-commission-0001
New Consortium Sets Goal of Improving Pipelines	5/27/2018	https://www.timesunion.com/business/oil/article/New-consortium-sets-goal-of-improving-pipelines-12941971.php
Principal Engineer Jay Almlie Discusses the iPIPE Program on Energy Matters Radio	5/31/2018	https://www.youtube.com/watch?v=ZQuwsK0z2aM
North Dakota Selects Ingu Solutions for Demonstration of Cutting-Edge Leak Detection and Prevention Technology for Oil and Gas Pipelines	5/31/2018	https://ingu.co/iPIPE/
Leak Detection Project Kicks Off This Summer	6/1/2018	https://myemail.constantcontact.com/Here-are-the-week-s-top-North-Dakota-energy-stories-.html?soid=1102657032033&aid=NpwT2Ynl17c
How A Canadian Solution to Detecting Pipeline Leaks Is Being Used in North Dakota	6/5/2018	https://www.bnnbloomberg.ca/video/how-a-canadian-solution-to-detecting-pipeline-leaks-is-being-used-in-north-dakota~1410402
iPIPE Program Helps Solve Pipeline Leaks in ND	6/6/2018	http://www.kfyrvtv.com/content/news/iPIPE-Program-helps-solve-pipeline-leaks-in-ND--484747291.html
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/10/2018	https://www.alvareviewcourier.com/story/2018/06/10/interesting-items/startup-uses-small-sensors-to-check-north-dakota-oil-pipes/37406.html
Sensors to Monitor Oil, Brine Gathering Lines Coming to ND	6/12/2018	https://www.westfargopioneer.com/news/science-and-nature/4459638-sensors-monitor-oil-brine-gathering-lines-coming-nd
Pipe Sensors to Monitor Gathering Lines	6/12/2018	https://bismarcktribune.com/business/local/pipe-sensors-to-monitor-gathering-lines/article_cd64586c-1d52-52df-83e6-b661d3b95f0a.html
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/21/2018	https://www.apnews.com/9d65538034a24711a4a84d4e2bb38efe
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/21/2018	https://www.usnews.com/news/best-states/north-dakota/articles/2018-06-21/startup-uses-small-sensors-to-check-north-dakota-oil-pipes
Startup Uses Small Sensors to Check North Dakota Oil Pipes	6/21/2018	https://m.washingtontimes.com/news/2018/jun/21/startup-uses-small-sensors-to-check-north-dakota-o/
iPIPE: Taking a Bite Out of Leaks	6/25/2018	http://blogs.und.edu/und-today/2018/06/taking-a-bite-out-of-leaks/
iPIPE: Taking a Bite Out of Leaks	6/29/2018	http://www.northdakotaagconnection.com/story-state.php?Id=688&yr=2018

Title	Date	URL
Industry Demonstrates Commitment to Stopping Pipeline Leaks	7/17/2018	http://northamericanshalemagazine.com/articles/2444/industry-demonstrates-commitment-to-stopping-pipeline-leaks
Testing of New Pipeline Inspection Device Begins in Bakken	7/18/2018	https://www.spe.org/en/ogf/ogf-article-detail/?art=4404
Testing of New Pipeline Inspection Device Begins in Bakken (Link Not Active)	7/18/2018	https://www.spe.org/en/print-article/?art=4404
6 Companies Collaborating on Pipeline Leak Detection	8/15/2018	https://www.willistonherald.com/news/companies-collaborating-on-pipeline-leak-detection/article_bbce3194-a098-11e8-8bac-1b765123019e.html
More Skin in the Game: New Technology to Find, Fix Leaks	8/20/2018	https://pgjonline.com/magazine/2018/august-2018-vol-245-no-8/features/more-skin-in-the-game-new-technology-to-find-fix-leaks
Burgum Highlights Oil Industry's Progress, Challenges at ND Petroleum Council's Annual Meeting in Fargo	9/25/2018	https://www.governor.nd.gov/news/burgum-highlights-oil-industry%E2%80%99s-progress-challenges-nd-petroleum-council%E2%80%99s-annual-meeting
Burgum Highlights Oil Industry's Progress, Challenges at ND Petroleum Council's Annual Meeting in Fargo	9/25/2018	https://votesmart.org/public-statement/1287849/burgum-highlights-oil-industrys-progress-challenges-at-nd-petroleum-councils-annual-meeting-in-fargo#.XDz9tVxKjE
The Digital Oilfield: How Digital Technologies Are Changing the Oil Industry in ND and Nationwide	9/30/2018	http://www.prairiebusinessmagazine.com/business/energy-and-mining/4506605-digital-oilfield-how-digital-technologies-are-changing-oil
Progress for Partners Key to Energy & Environmental Research Center		https://www.ndliving.com/content/progress-partners-key-energy-environmental-research-center
API Banquet Salutes Stars of Bakken Oil and Gas	11/19/2018	https://www.willistonherald.com/news/api-banquet-salutes-stars-of-bakken-oil-and-gas/article_a006f78e-eb98-11e8-a353-abe9fc1170fc.html
Energy Matters: iPIPE Receives Industry Innovation Award	12/3/2018	https://www.youtube.com/watch?v=L2lEr2Xu4aw
Energy Matters with iPIPE	12/12/2018	https://www.satelytics.com/blog/oil-gas-solutions/2018-energy-matters-with-iPIPE/
Developing Technology to Prevent Pipeline Leaks	1/3/2019	https://mydigitalpublication.com/publication/?i=547462&p=&pn=#{%22issue_id%22:547462,%22page%22:34}
Innovative Pipeline Consortium Marks New Highlights	1/8/2019	http://undeerc.blogspot.com/2018/12/innovative-pipeline-consortium-marks.html
2018 State of the State Address	1/23/2019	https://www.governor.nd.gov/events/2018-state-state-address
North Dakota Eyes Expanded Use of Drones for Oil and Natural Gas Operations	2/8/2019	https://www.naturalgasintel.com/articles/117347-north-dakota-eyes-expanded-use-of-drones-for-oil-and-natural-gas-operations
The Crude Life Interview: Joe Dancy, Energy Expert & Educator	5/18/2019	http://www.thecrudelife.com/podcast/the-crude-life-interview-joe-dancy-energy-expert-educator/
The Big Data Revolution: Detecting Pipeline Leaks, Encroachments and More Using Satellites	6/15/2019	https://www.pipeline-journal.net/journal/pipeline-technology-journal-32019
Energy Matters Radio: iPIPE	9/6/19	https://youtu.be/4tTA_WEsMI8
iPIPE Program Assisting in Detection Of Pipeline Leaks in the Pipeline & Gas Journal September Edition (Page 50-52)	9/10/2019	https://www.nxtbook.com/nxtbooks/gulfpub/pgj_201909/
iPIPE Receives IOGCC Chairman's Stewardship Award for Environmental Partnership	9/10/2019	https://www.am1100theflag.com/news/10755-iPIPE-receives-iogcc-chairman%E2%80%99s-stewardship-award-environmental-partnership
iPIPE Receives Chairman's Stewardship Award	9/10/2019	http://undeerc.blogspot.com/2019/09/iPIPE-receives-chairmans-stewardship.html
iPIPE Receives Chairman's Stewardship Award	9/13/2019	https://www.willistonherald.com/news/business/iPIPE-receives-stewardship-award/article_e7c45bf0-d636-11e9-b069-739139b5d75b.html
API Award Winner Shares What Recognition Has Meant	10/14/2019	https://www.willistonherald.com/news/oil_and_energy/api-award-winner-shares-what-recognition-has-meant/article_ec10b56a-eecc-11e9-a94a-0f17a0778d95.html
AI Raising Drone Game in Oil, Gas but FAA Challenges Remain	10/15/19	https://www.naturalgasintel.com/articles/119892-ai-raising-drone-game-in-oil-gas-but-faa-challenges-remain
Almlie and Helms: Where Innovation Leads, Regulation Follows	10/18/19	https://trib.com/opinion/columns/almlie-and-helms-where-innovation-leads-regulation-follows/article_ee198ef8-05aa-599f-9df9-67bfd8492bc0.html

Title	Date	URL
Shared on Drilling Info's Social Media Site: Almlie, Helms: Innovation Leads, Regs Follow	10/20/19	https://www.grandforksherald.com/opinion/columns/4728897-Almlie-Helms-Innovation-leads-regs-follow
Almlie, Helms: Innovation Leads, Regs Follow	10/20/19	https://www.grandforksherald.com/opinion/columns/4728897-Almlie-Helms-Innovation-leads-regs-follow
Where Innovation Leads, Regulation Follows	10/21/19	https://bismarcktribune.com/opinion/letters/where-innovation-leads-regulation-follows/article_6018311c-49fd-5744-b815-2a485b881e59.html
Bakken Backers E-Mail: Almlie, Helms: Innovation Leads, Regs Follow	10/25/19	https://www.grandforksherald.com/opinion/columns/4728897-Almlie-Helms-Innovation-leads-regs-follow
Cleanup Continues after Keystone Pipeline Oil Spill near Edinburg, ND	11/4/19	https://www.grandforksherald.com/news/accidents/4754456-Nearly-half-of-the-oil-has-been-recovered-in-Keystone-Pipeline-incident-says-TC-Energy
ND Keystone Spill about Half Recovered, Official Says	11/4/19	https://www.bemidjipioneer.com/business/energy-and-mining/4755069-ND-Keystone-spill-about-half-recovered-official-says
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