

# Yellowstone River Crossings



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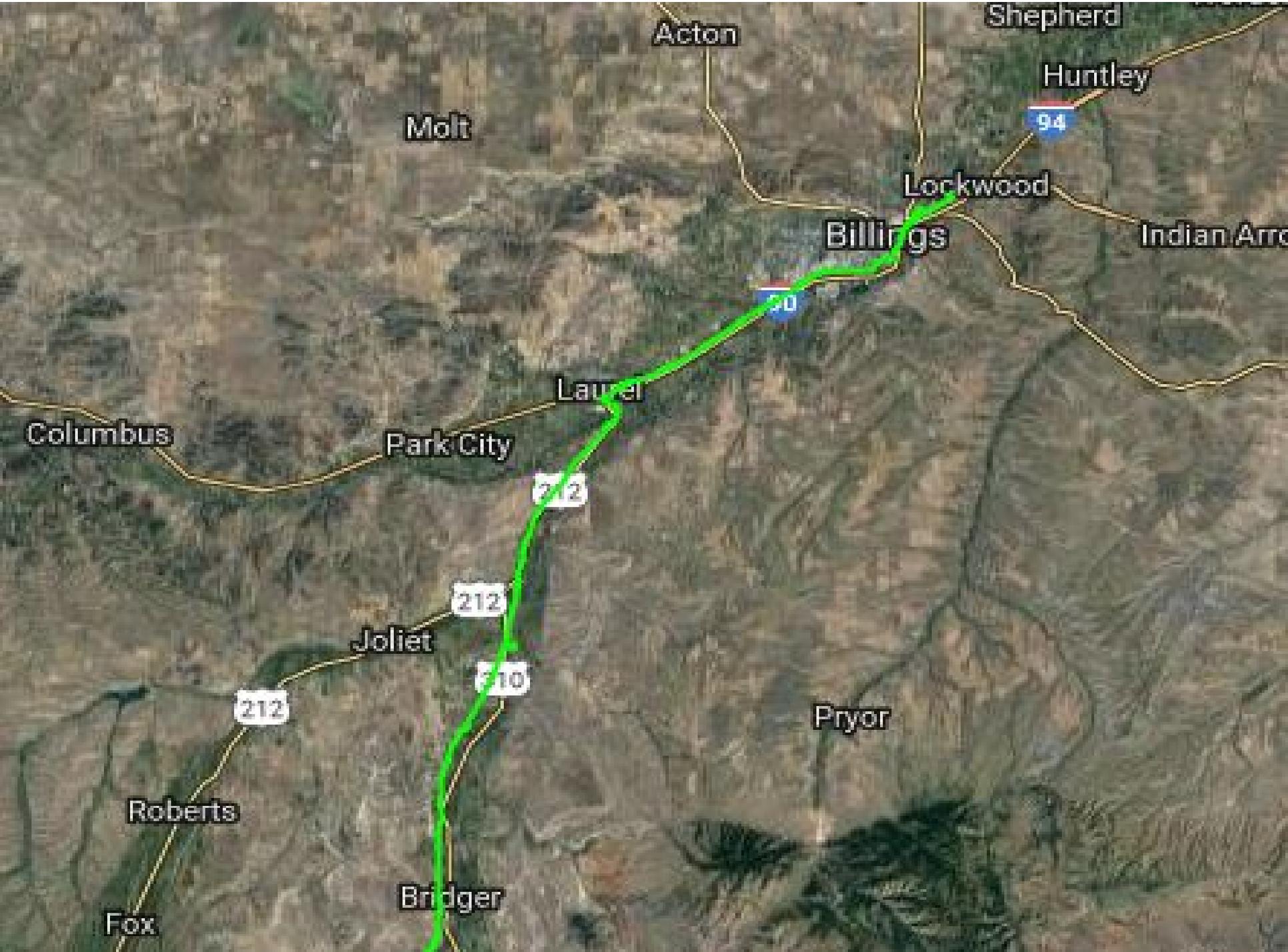
# Silvertip Pipeline

- July 2011
- Near Laurel, Montana
- Summer Flooding



# Silvertip – July 2011





Acton

Shepherd

Huntley

Molt

94

Lockwood

Billings

Indian Arrow

50

Laurel

Columbus

Park City

212

212

Joliet

510

212

Pryor

Roberts

Bridger

Fox

# High Profile Accident

## Silvertip – July 2011

- Silvertip pipeline released an estimated 1000 barrels of crude oil into the Yellowstone River near Laurel, Montana; Est. \$42M damages
- River scour is cause of accident
- Operator was aware and monitored the flood conditions; had numerous remote actuated valves at rivers
- Controllers took 56 minutes after first alarm to close valve adjacent to river



# Silvertip – July 2011



# Silvertip (continued)

- Operator did not appear to explicitly integrate local river crossing information, particularly local stream information, into their IMP when determining their preventative and mitigative measures
- MT Governor's and PHMSA task force revealing few pipeline companies incorporate river and geotechnical risks when determining P&M measures



# Another High Profile Accident in PHMSA's Western Region

- 1/17/15 – Poplar Pipeline spills crude oil into the Yellowstone River near Glendive, MT

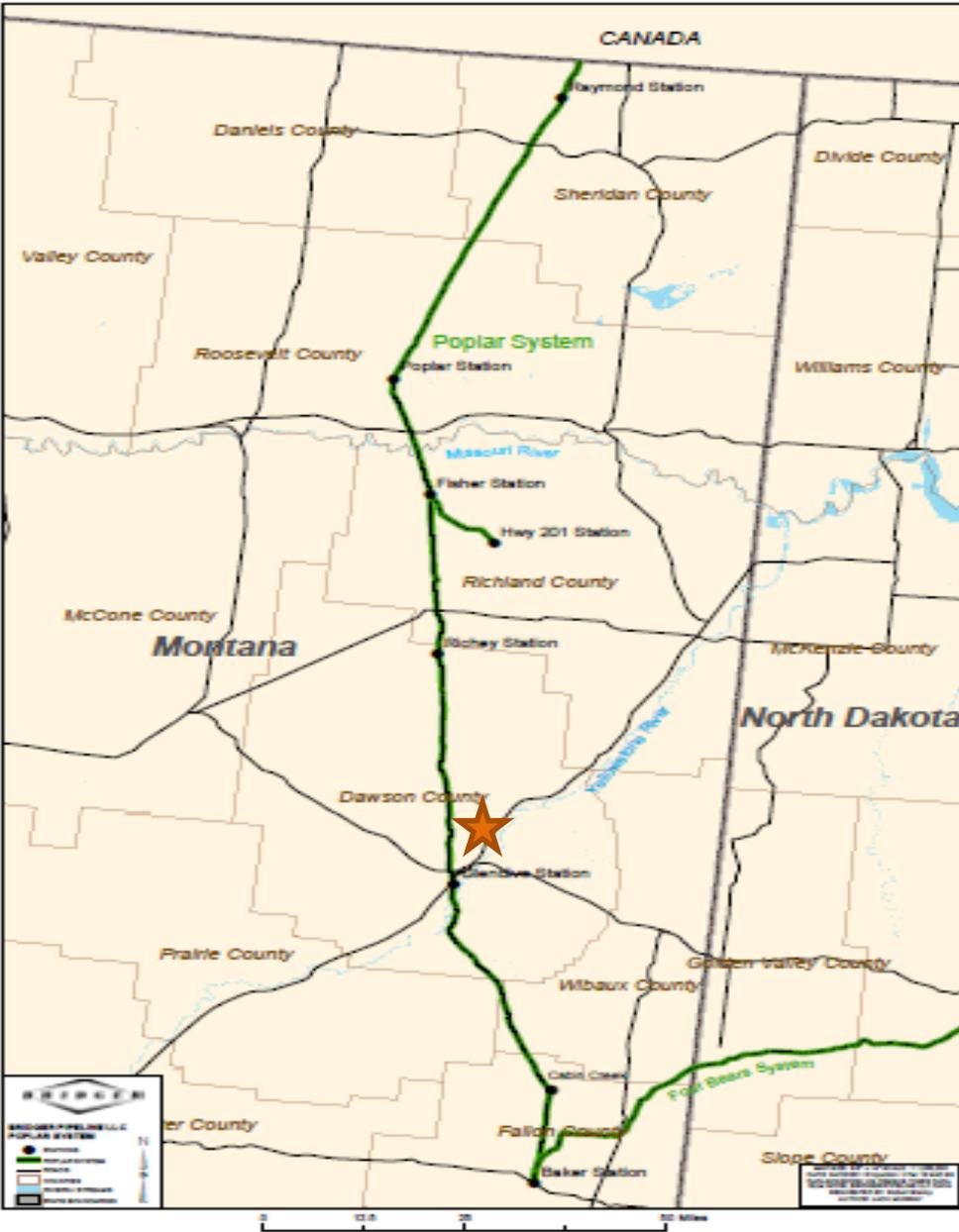


# The Release

- The Poplar Pipeline ruptured on Saturday January 17, 2015, spilling approximately 30,000 gallons of crude oil into the Yellowstone River.
- Findings show that the pipe was exposed in the river following an ice dam event in 2014. This pipe exposure went undetected and the line failed due to water induced forces & vibrations.



# Poplar Pipeline System



# Poplar Pipeline Breach

- The pipeline was shut down at approximately 1:00pm EST due pressure drop and meter in and out readings not matching. The North and South Block Valves were closed remotely on either side of the Yellowstone River
- At about 5:00pm EST, Operator notified local authorities of a potential release and the MT DEQ notified municipal water utilities of the potential of crude oil passing by their water intakes on the Yellowstone River downstream of the pipeline.
- Operator filed a report with NRC at 5:58 pm EST stating possible release



# Pipeline Breach Cont.

- At first light on Sunday, January 18, 2015, Operator discovered an oil sheen in open water on the Yellowstone River approximately 3/4 -mile downstream from the pipeline crossing.
- Operator amended NRC report filed at 10:12am EST on January 18, 2015 to state that there was a release of crude oil into the Yellowstone River.
- Spill response began at approximately 2:00pm EST on January 18, 2015
- Initial estimate of 300-1200 BBIs were released between the North and South Block Valves.



# Yellowstone River Near Glendive, MT



# Pipeline Crossing Details

- 6800 feet between the North and South Block Valves with the river in between
- 2200 feet in this section is 12-inch, X52, .5-inch wall thickness, seamless pipe installed in 1967
- Crossing was inspected utilizing a depth of cover survey on September 17, 2011
- Maximum Operating Pressure (MOP) was 1200 psig



# Yellowstone River Response

Workers recovered a total of 1,722 gallons/41 BBLs of oil from the iced over river.



# Oil Spill Numbers

- 490 barrels recovered from pipeline
- 41 barrels recovered
- 694 barrels unrecovered from the river
- Actual operating pressure of pipeline was 523 psig (Maximum is 1200 psig)



# Moving Forward

- PHMSA issued CAO that requires:
  - Shut down of entire Poplar System
  - Submit restart plan of system or segments
  - Replace/repair the crossing
  - Operate at reduced pressure
  - Review of pipe & ILI data
  - Failure analysis
  - Root Cause determination
  - Review Emergency Response Procedures
  - Other requirements if needed after root cause determination



# Recovered Pipe April 8, 2015



# Montana Pipeline River Crossings Study



# PHMSA's Focus (for MT River Crossings)

1. Petroleum pipelines (crude oil and refined products)
2. Major river crossings (greater than 100 feet)
3. Located in Montana and rivers flowing into Montana
4. Constructed with open-trench technology
5. Exposed or lack of depth-of-cover
6. River history & characteristics
7. Follow-up on mitigation measures recommended by Operators consultants



# Montana River Crossings

Operator	Major River Crossings (open-cut, > 100 feet)	Installed by Open Cut	Installed by HDD	Installed above water (bridge/suspension)
ExxonMobil	4	1 (4)	3 (0)	
CHS	9	2 (3)	6 (5)	1
Phillips 66 (80 feet or greater)	26	12 (22)	14 (4)	
Hiland Partners (2014)	1		1	
Plains	1		1	
Marathon (Wyoming)	6	3	3	
Spectra Energy	10 (3 in WY)	4	6	
ONEOK	1 (HVL)		1	
Bridger Pipeline	3	2	1	

\* Numbers in red represent before July, 2011



# Future Remediation's 2015 and Beyond

- Bridger Pipeline:
  - Yellowstone River: Planned HDD
- CHS:
  - Tongue River: Planned 2015 HDD
- Phillips 66:
  - Yellowstone River @ MP 2.2, 2015 Planned 2015 HDD
  - East Gallatin River (Bozeman) @ MP 137.5, 2015 HDD Planned
  - Clark Fork @ MP 296.3, 2016 HDD Planned
  - Clark Fork @ MP 313.5, 2016 HDD Planned
  - Additional smaller river crossings



# Remaining Trenched Crossings On Yellowstone River

- Yellowstone River at Billings: Bundled crossing. Includes 5 pipelines (8" – P66, 12" P66, 12" – Exxon, 8" – CHS, 8" – MDU).
- Seminoe Pipeline - Yellowstone River @ MP 2.2, 2015 Planned HDD



# Why Did These Releases Occur?

- Force against a fixed object causes vibration.
- Much like a liquid metering device that measures vibration frequency to determine volume.
- If not designed for it then it causes fatigue and failure.



# Lessons Learned

- Integrate water crossings into IMP for P&M measures
- Inspect crossings during and after Flood events
- Minimum inspections interval is if no events
- More Frequent Inspections if Needed
- Mississippi River Crossing
- Manage River Crossings – Trenched?



# Questions??



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