

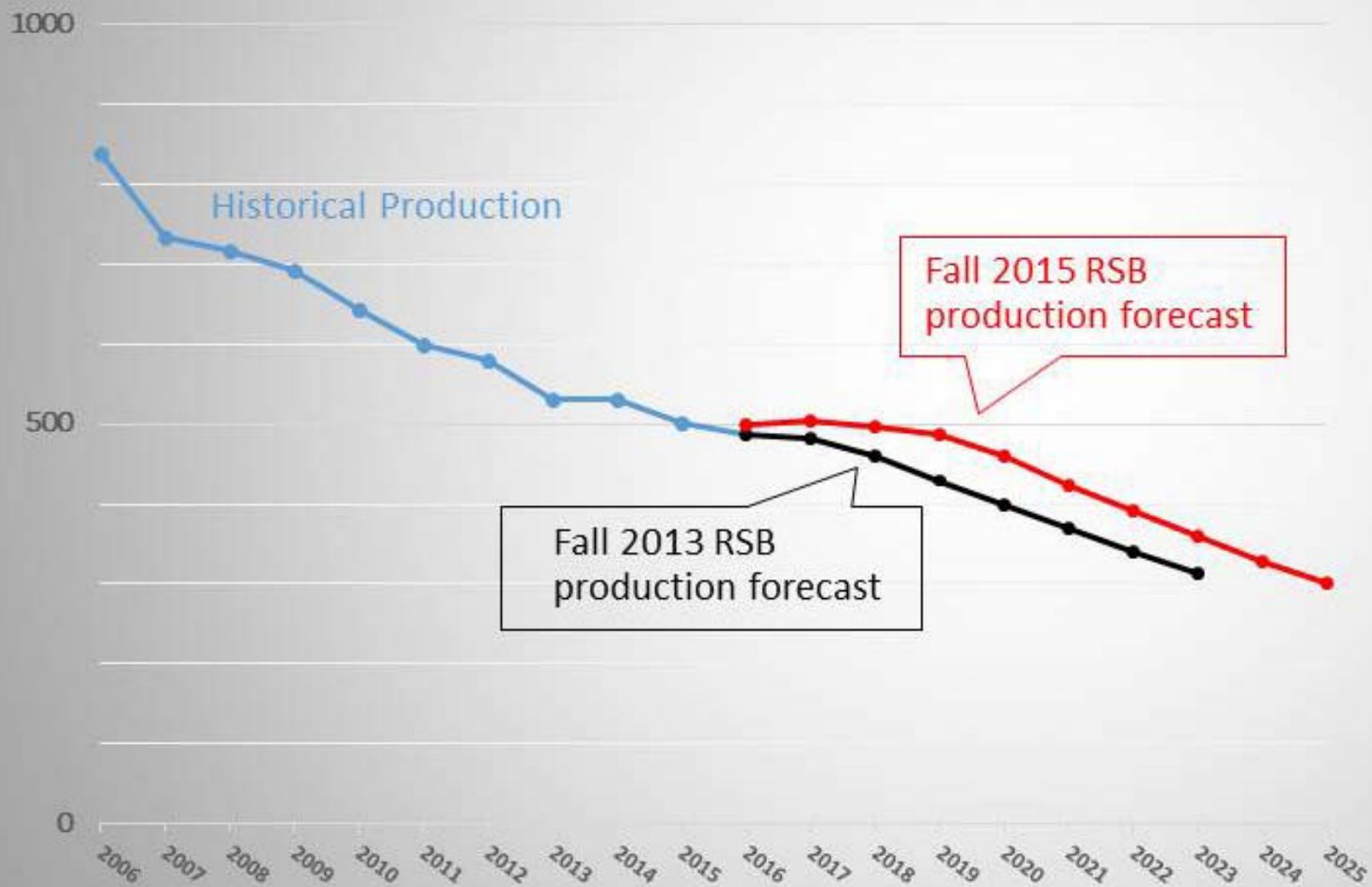
# The heat is on: Managing declining throughput challenges

Rob Annett, Appraise Engineering Manager

February 2016



# TAPS Throughput Historical & Forecasted



Production and Forecast figures: State of Alaska DOR, Fall 2013 & Fall 2015 Revenue Sources Book



# TAPS Throughput (MBD)

- Flow rate

2.1mmbpd = 4.5 day transit time

0.5mmbpd= 18 day transit time

- Water/ice

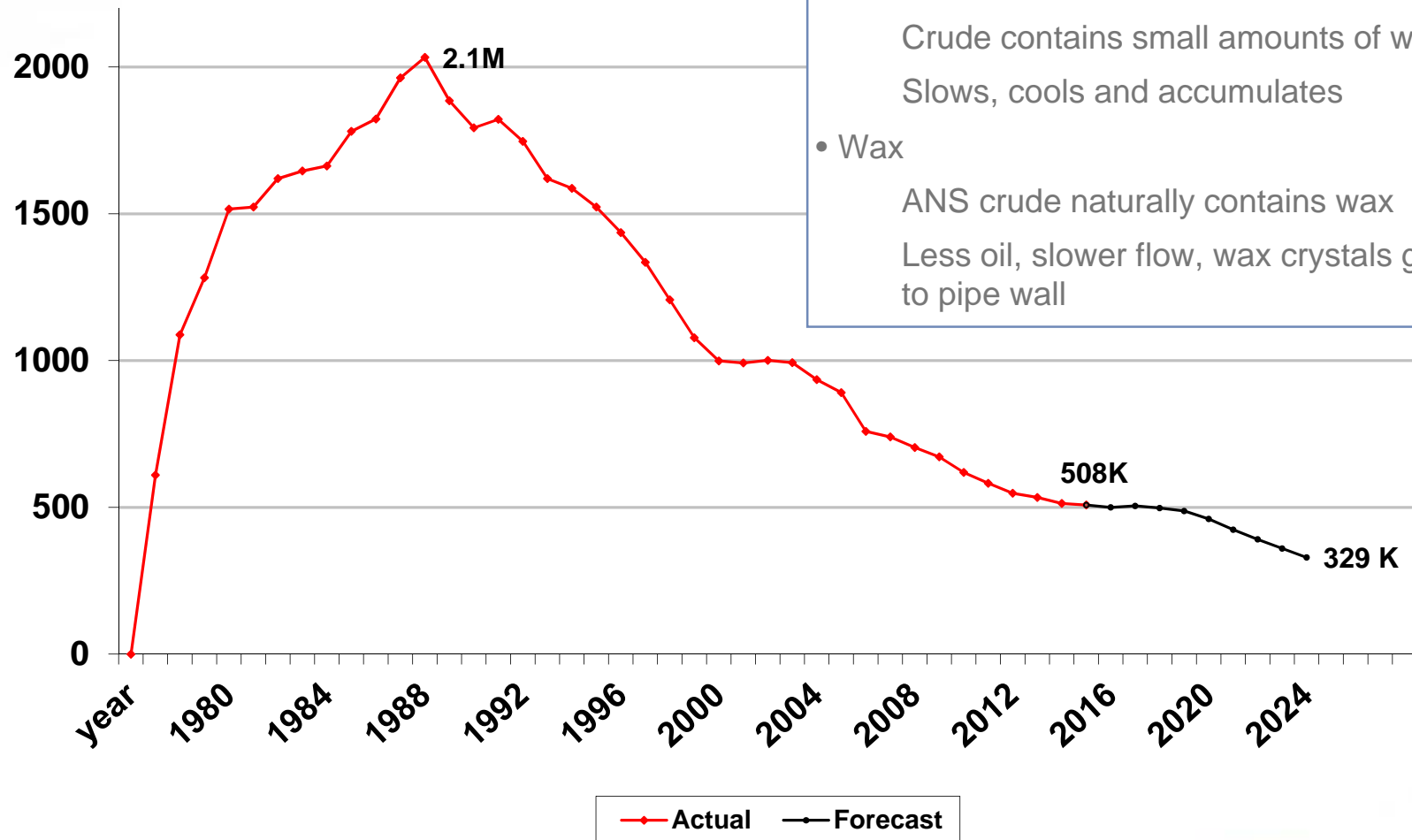
Crude contains small amounts of water

Slows, cools and accumulates

- Wax

ANS crude naturally contains wax

Less oil, slower flow, wax crystals gravitate to pipe wall

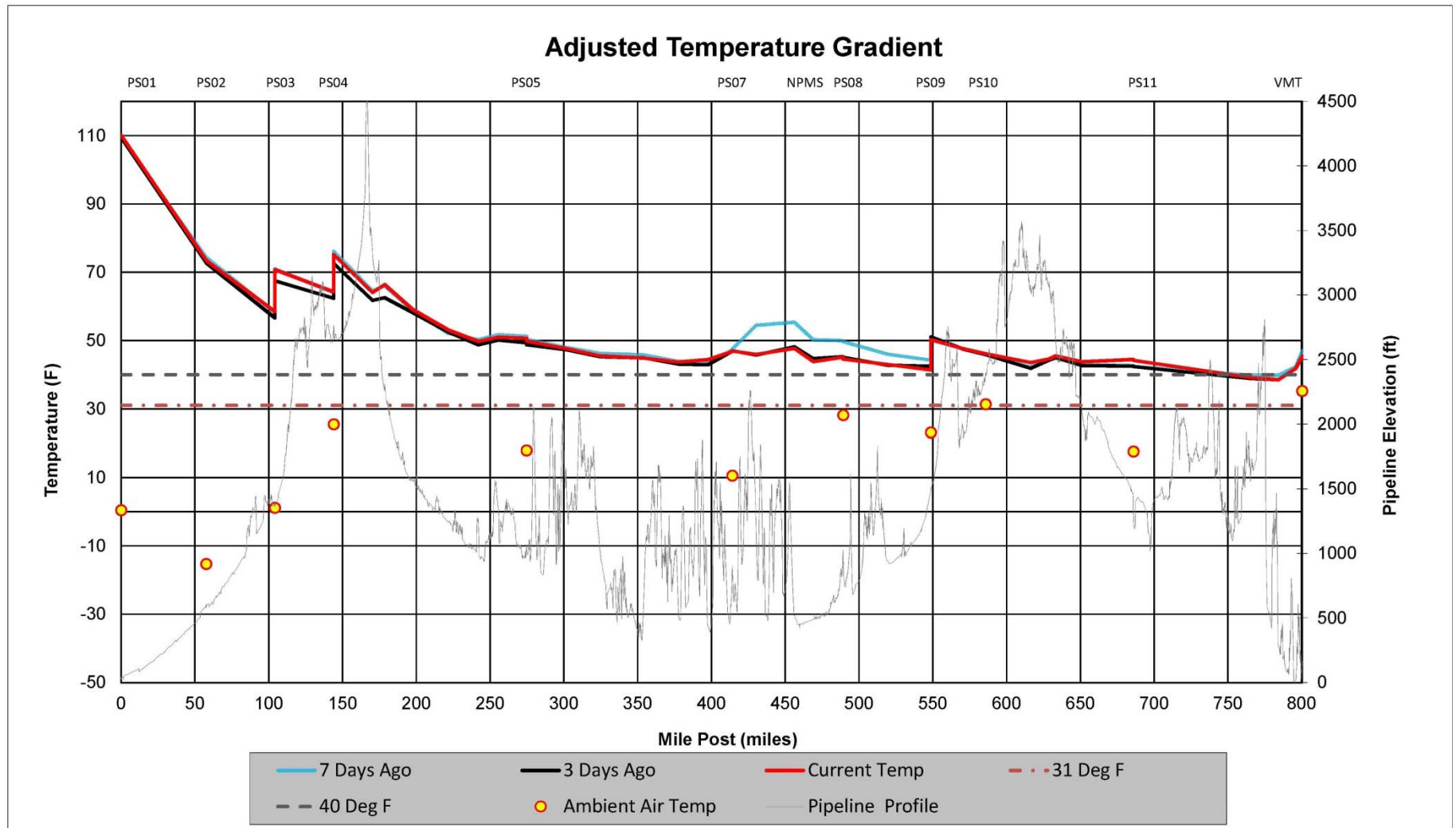


Forecast figures: State of Alaska DOR, Fall 2015 Revenue Sources Book  
Actual figures are calendar year; forecast figures are State of Alaska fiscal year

# Current Temperature Profile

Current Time

1/25/16 1:20 PM



# Cold weather operations

## Increasing challenge

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- Recirculation at Pump Stations 3, 4, 7 and 9
- Heat added at RGV 65
- Snow removal in Valdez
- Maintaining “steady state”
- Increases system complexity





# Point-Source Heat, Winter 2015-2016





# Point-Source Heat, Winter 2015-2016

- Crude oil heating at RGV65
- Crude oil heating at PS8 (20 MMBTU/HR for winter 2016-17)



# Flow Assurance Testing Program

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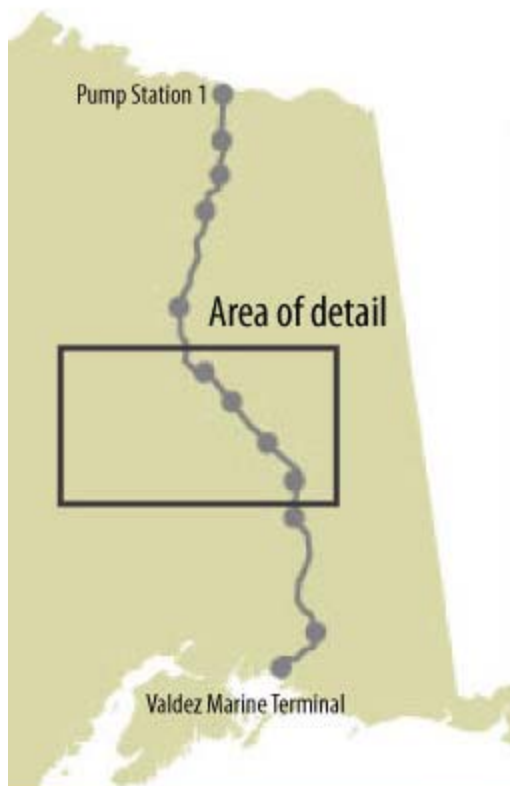




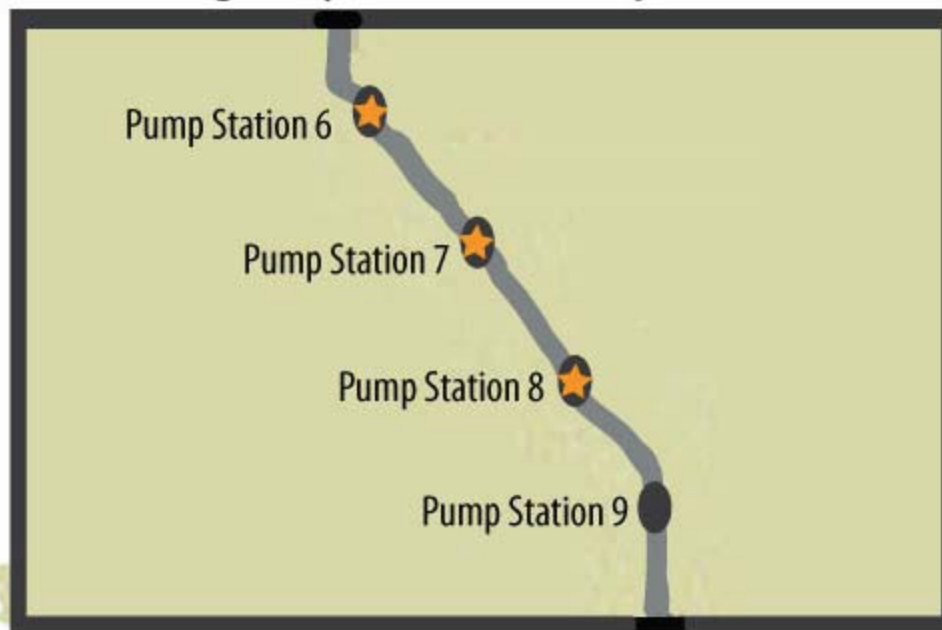
# Water: Perforated plate video

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## Contingency methanol injection sites



### Sites by pipeline milepost

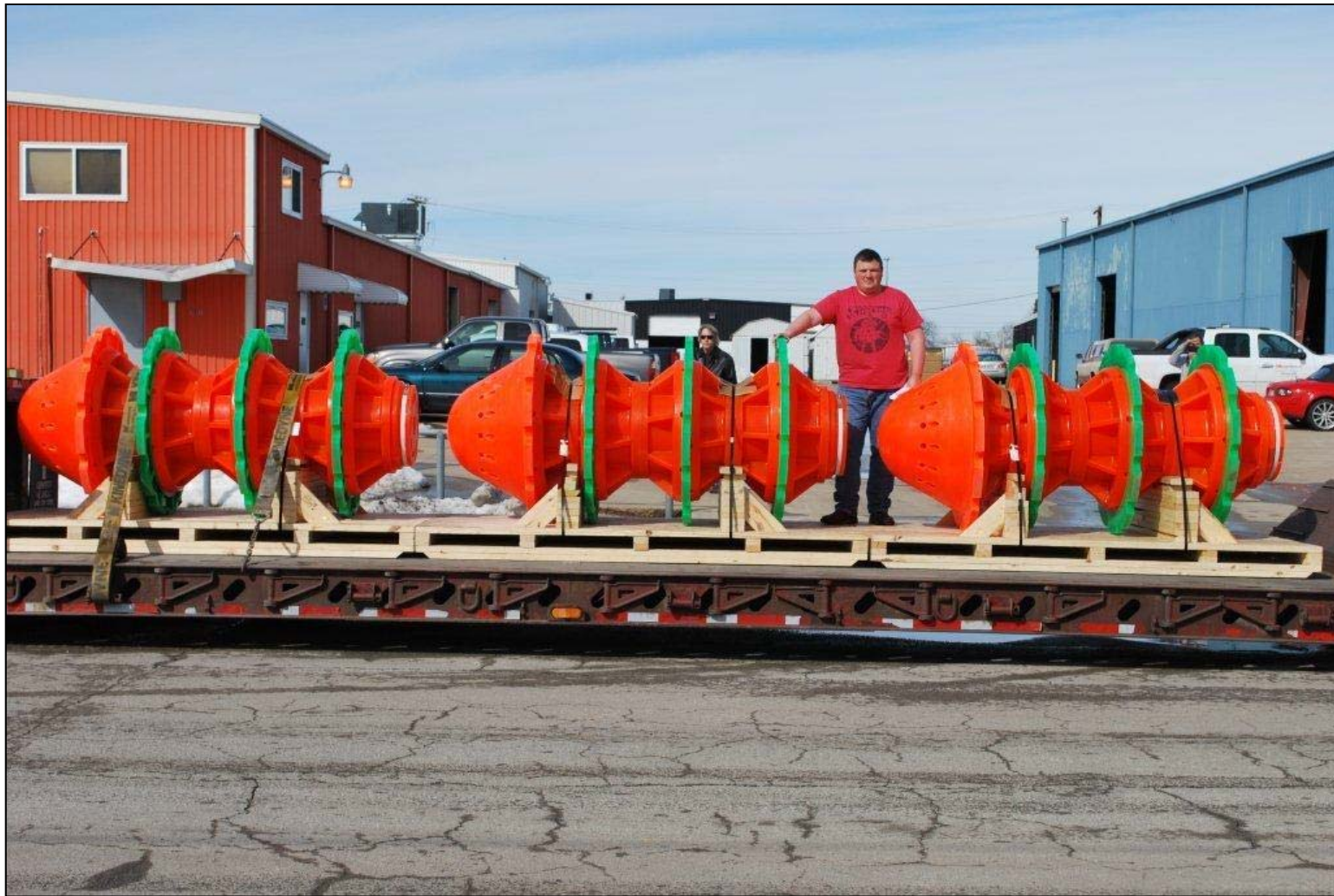
- PS 6, PLMP 355
- PS 7, PLMP 414
- PS 8, PLMP 489.1



### Closer look at injection site

- Existing 1-inch valve attached to mainline pipe at Pump Station 7.
- This is the actual location where contingency methanol would be injected if needed at PS 7.

# Wax Management

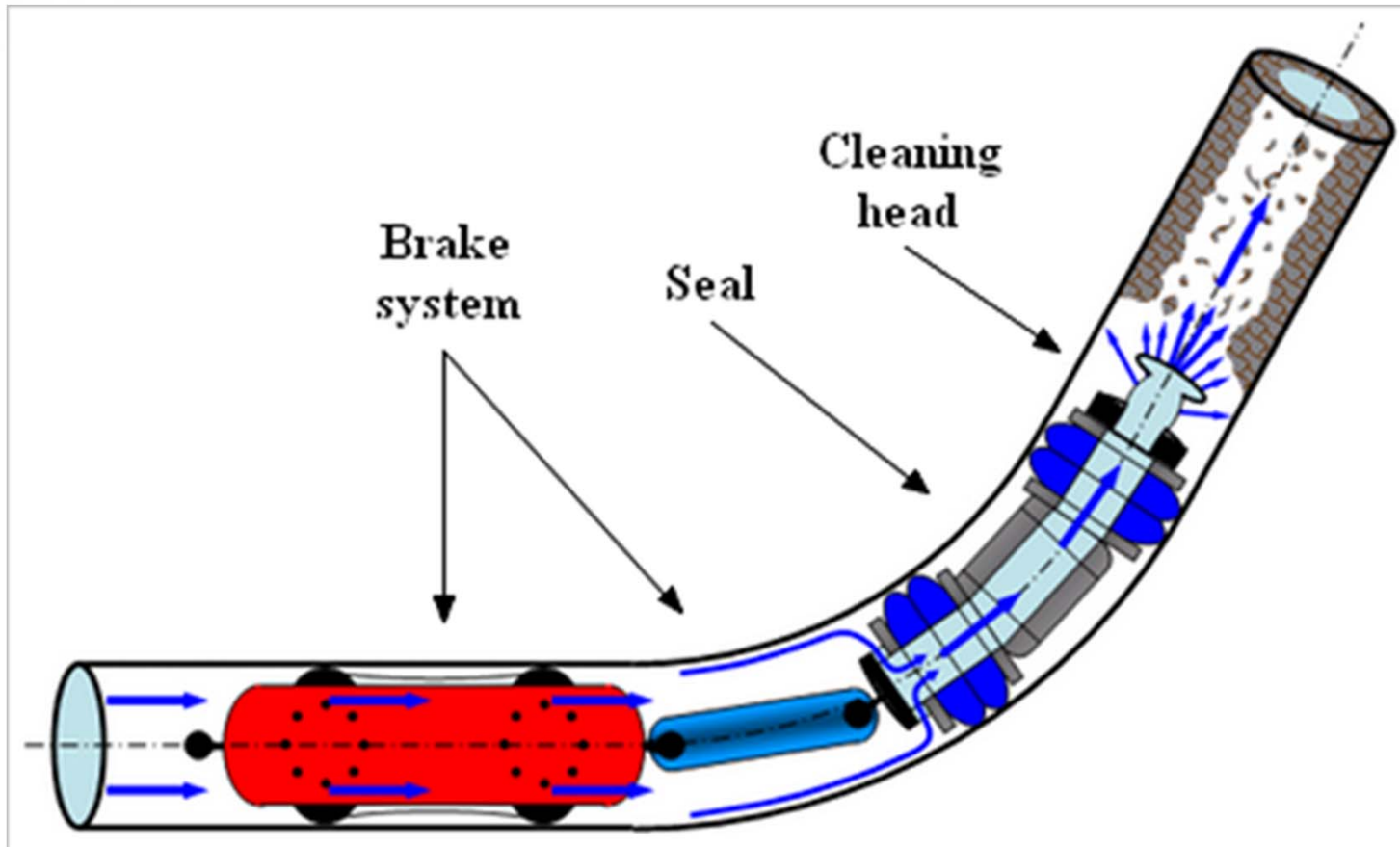




# Wax Management



# Wax Management









# TAPS people: focused on safety, integrity, innovation



# The only easy day was yesterday. (Navy Seals)



2015 Alaska Federation of Natives panel on the Alaska economy.

*"It's 'no easy day.'  
Because it's hard, doesn't  
mean we do nothing."*

Tom Barrett

*"Be engaged in what's  
happening today and  
opportunities for  
tomorrow."*

Sophie Minich

*"We put our differences  
aside and come  
together on what's  
really important."*

Crawford Patkotak

Pictured, left to right: Tom Barrett, Alyeska Pipeline Service Company President; Sophie Minich, CIRI President & CEO; Crawford Patkotak, ASRC Chairman of the Board; Lori Henry, NANA, VP & COO