Declining Flow
and
the Trans Alaska Pipeline System (TAPS)

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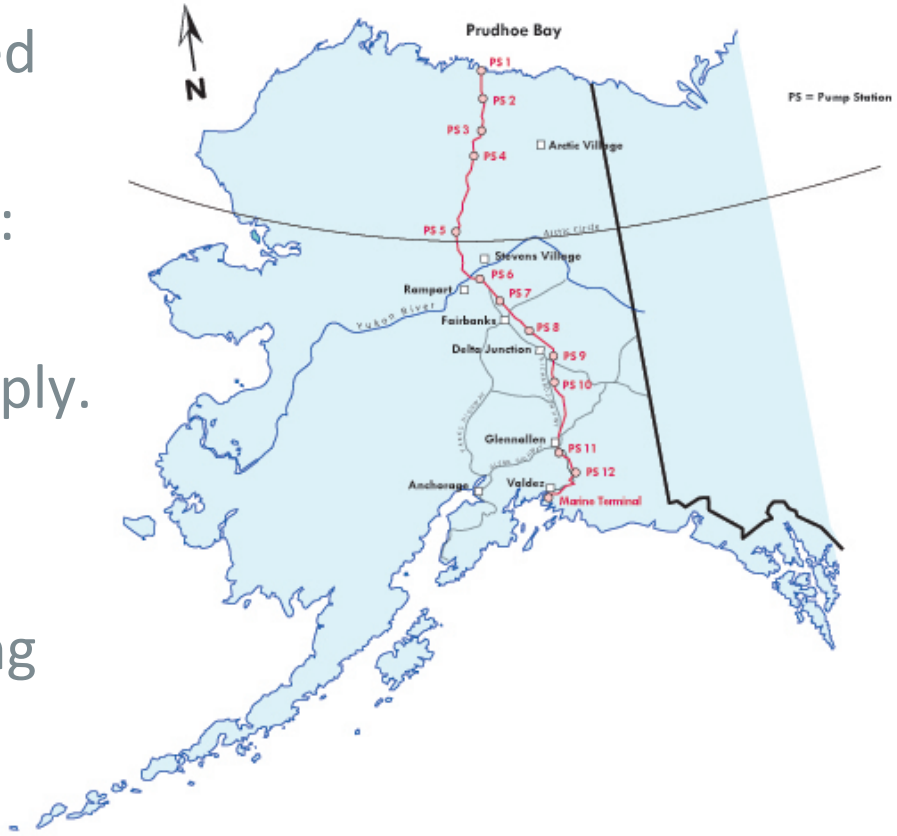
Presented to

Resource Development Council

September 1, 2011

Trans Alaska Pipeline System

- TAPS Arctic pipeline operated successfully for 34 years.
- Current throughput average: 600,000+ bpd.
- 11% of U.S. domestic oil supply.
- Nationally significant infrastructure.
- Throughput steadily declining 5-6% per year.



Engineering Marvel

- 48-inch diameter
- 800 miles long
  - 420 miles above ground (78,000 VSMs)
  - 380 miles below ground
- Designed as hot pipeline in an arctic environment

- Overcame many operational challenges
  - Remote locations
  - Permafrost
  - Large river crossings
  - Extreme weather conditions
  - Three mountain ranges
  - Seismically active regions (safely withstood 7.9 earthquake in 2002)

Qualified, exceptional workforce with arctic experience

Talented employees capable of managing technical challenges

Alaskan experience, talent & “True Grit”

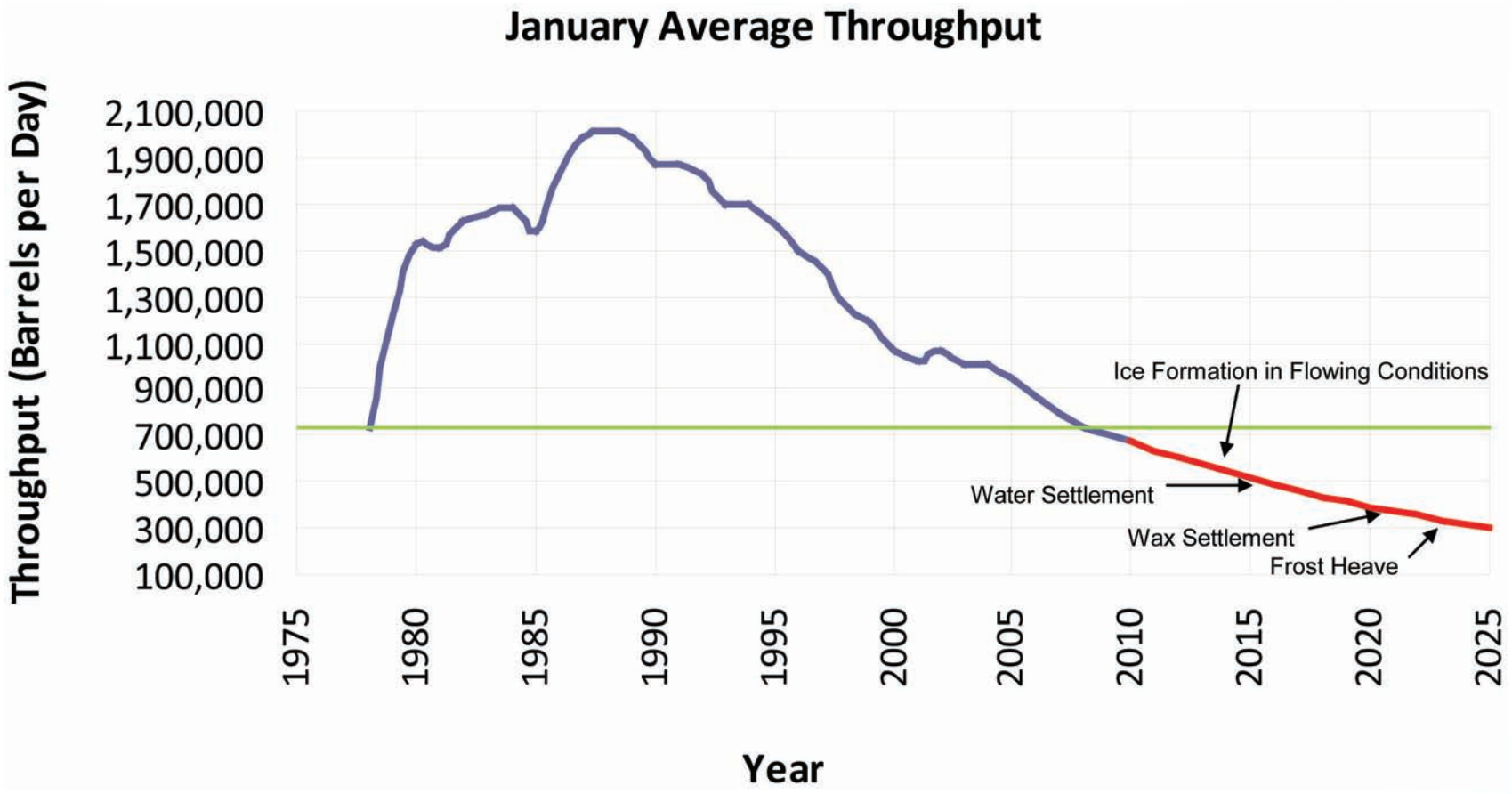
Record / Focus

- 16 billion barrels and counting
- Strong safety, environmental, & conservation record
- Arctic caribou population growing:
  - 2008: 66,772
  - 2002: 31,857
  - 1997: 19,730
  - 1975: 5,000

- Focus: **Flawless Operations**
  - Safety, Environment & Reliability
- Multiple recipient of American Petroleum Institute awards for environmental and safety practices.

Figures supplied by Matthew A. Cronin, Ph.D
University of Alaska Fairbanks

Declining Throughput Challenge



Declining Flow

- TAPS faces significant technical challenges related to declining flow rates
  - **Slower velocities**; longer transit times
    - At 600,000 bpd >15 days PS1 to Valdez
    - At 300,000 bpd >30 days PS1 to Valdez
  - **Lower temperatures**
  - Less turbulence with lower flow rates
    - Water & crude oil solids settle out of the crude oil
- Expect longer shutdowns, interrupting supply and revenue

Simplest Solution

- Most direct solution:
  - **Stop the decline**.
  - **Re-fill the pipe (TAPS engine dipstick below the "Add-Oil" line)**.
- URGENCY: pipeline operational challenges increasing;
  - More risk of extended shutdowns.
  - Rate of decline exceeding projections.
- Oil plentiful in Alaska, onshore and offshore.
- Taking too much time to bring new production online.
- Need responsible but more rapid and predictable permitting process.
- CD-5 example – regulatory morass/delays (plus regulatory solutions don't seem aligned with pipeline operational risks).

TAPS Low Flow Study
300,000 bpd Challenge

- Good for the State of Alaska?
  - $156 billion in revenue collected since statehood
- Good for the nation?
  - Recent Strategic Petroleum Reserve withdrawal of 30 million barrels.
  - At 1 million bpd, which TAPS could easily transport (vs. current 600,000 bpd), TAPS would add more than 4x that withdrawal **annually** to U.S. supply

The 300,000 barrel question . . .

- Is 300,000 bpd where we really want to be?
- Energy security?
- Jobs?
- Quality of life?

Questions?