

02/05/13

SB 21 -

Oil

Industry

Presenta-
tions

<TARGET><BILL>SB 21</BILL><SUBJECT>02-05-13 SB 21 - Oil
Industry Presentations</SUBJECT><COMM>STTP28</COMM></TARGET>



AOGA

**OIL & GAS:
FUELING
ALASKA'S
ECONOMY**

Senate Special Committee on TAPS Throughput

February 5, 2013

Kara Moriarty, Executive Director

Alaska Oil and Gas Association

Purpose

- Serve as single point of contact for Alaskans on the state's oil and gas industry
- Provide a forum for discussion and a point of decision on issues that affect the industry

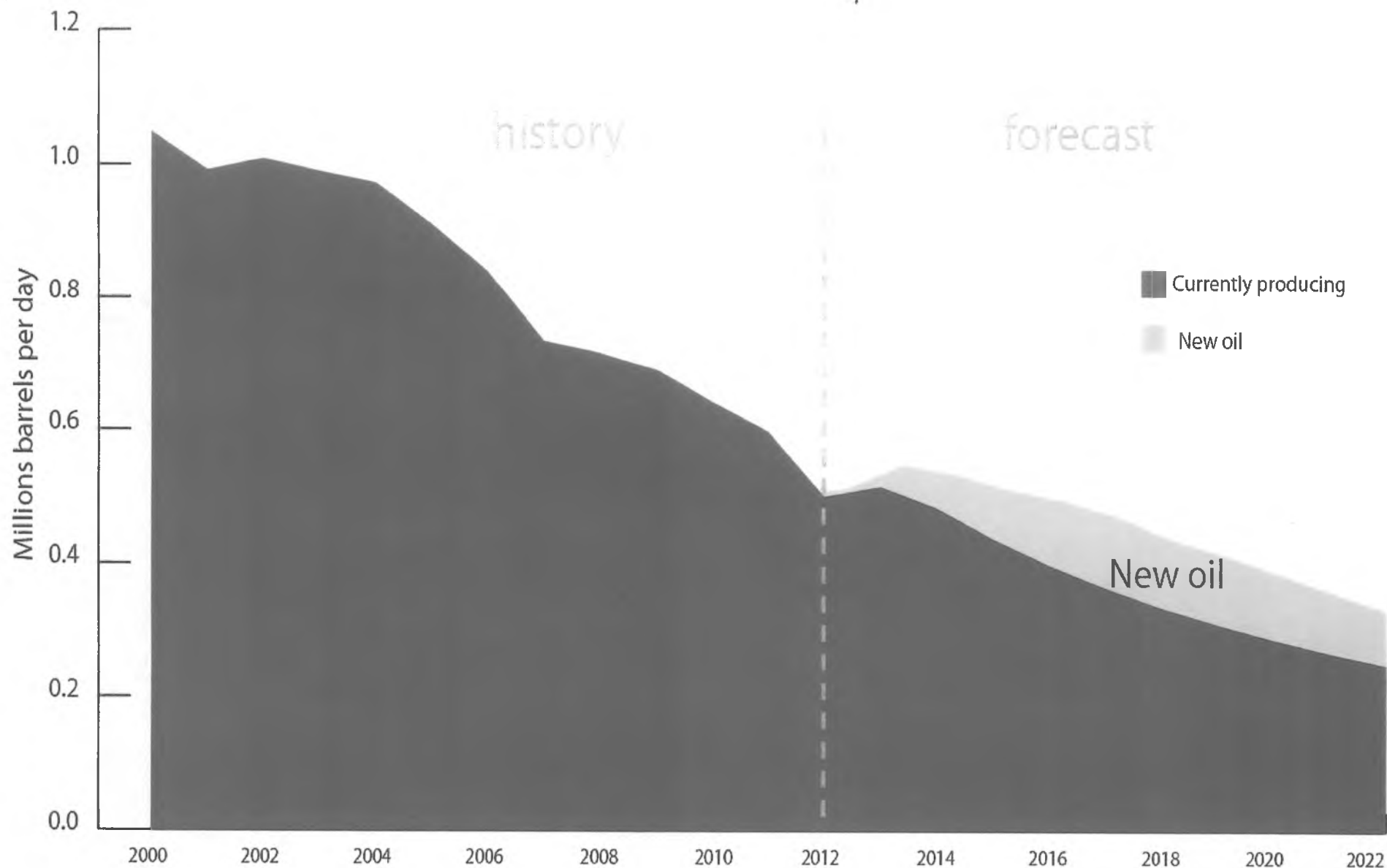
Mission

Long-term viability of the Alaska's Oil & Gas Industry for the benefit of all Alaskans



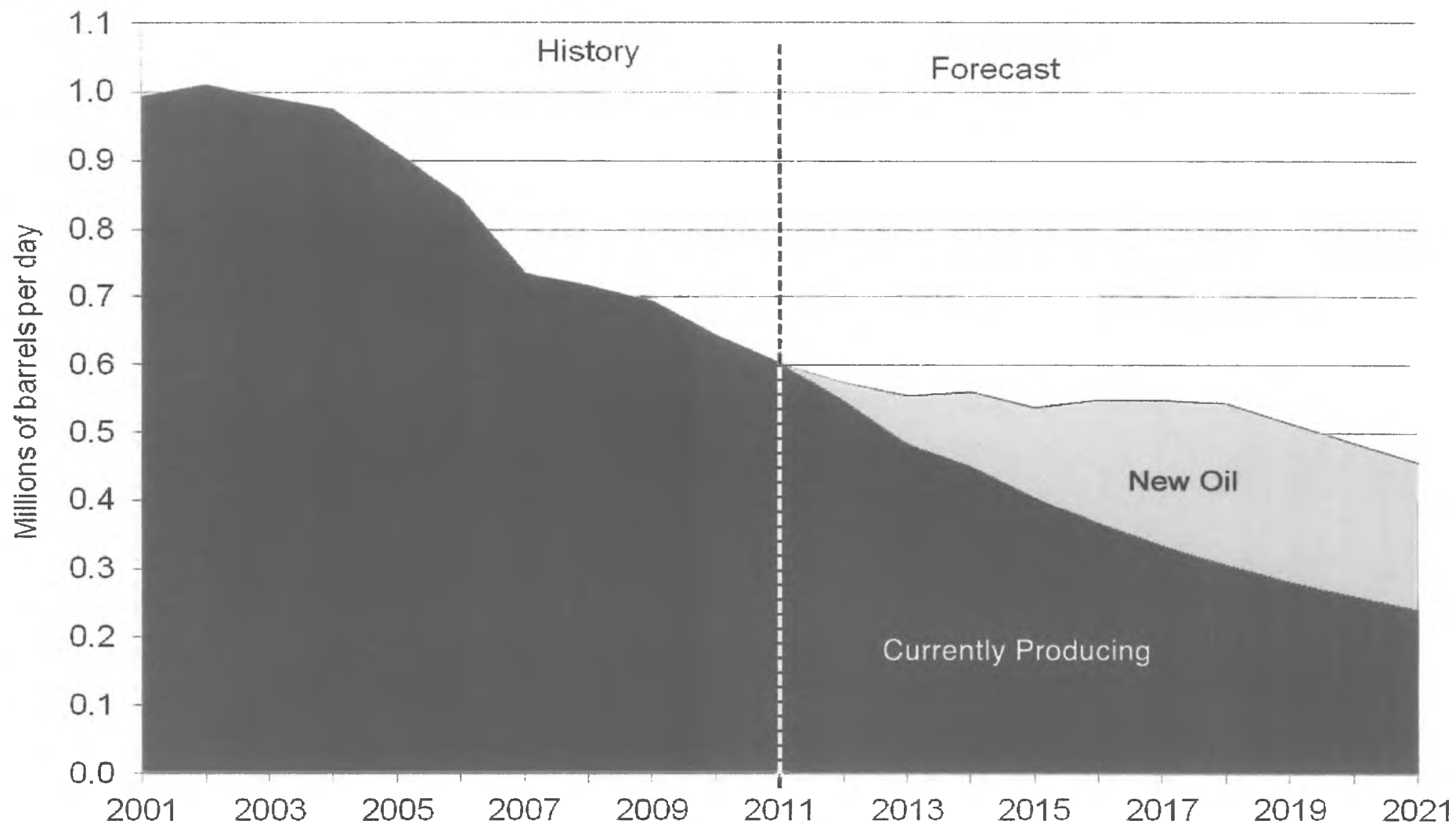
Alaska North Slope Production

FY 2000-2012 and Forecasted FY 2013-2022



Source: Department of Revenue - Dec. 2012

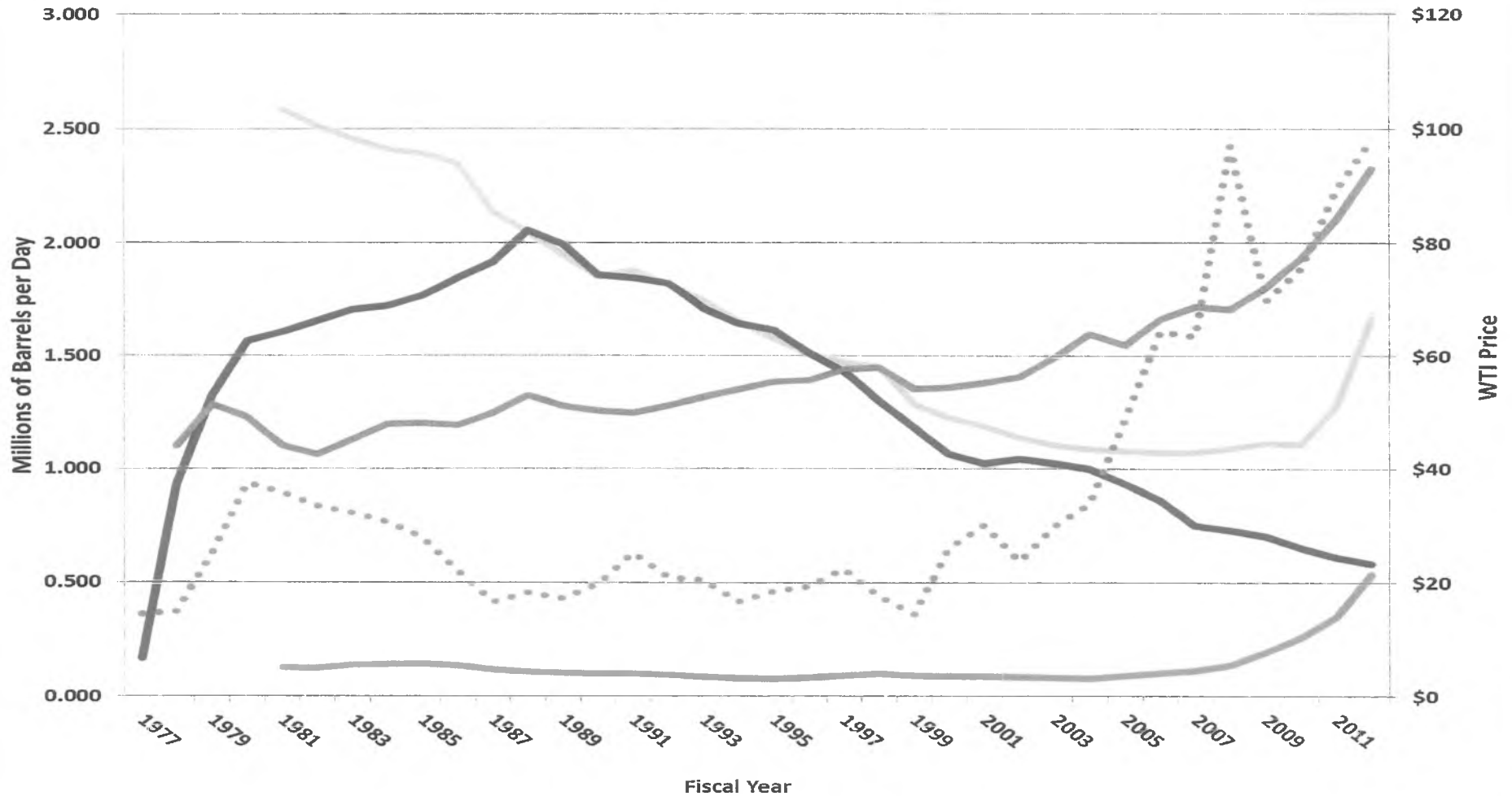
Production Decline Is Real



Source: State of Alaska

Competition at High Oil Prices

Historical Oil Production Curves with Nominal WTI Price



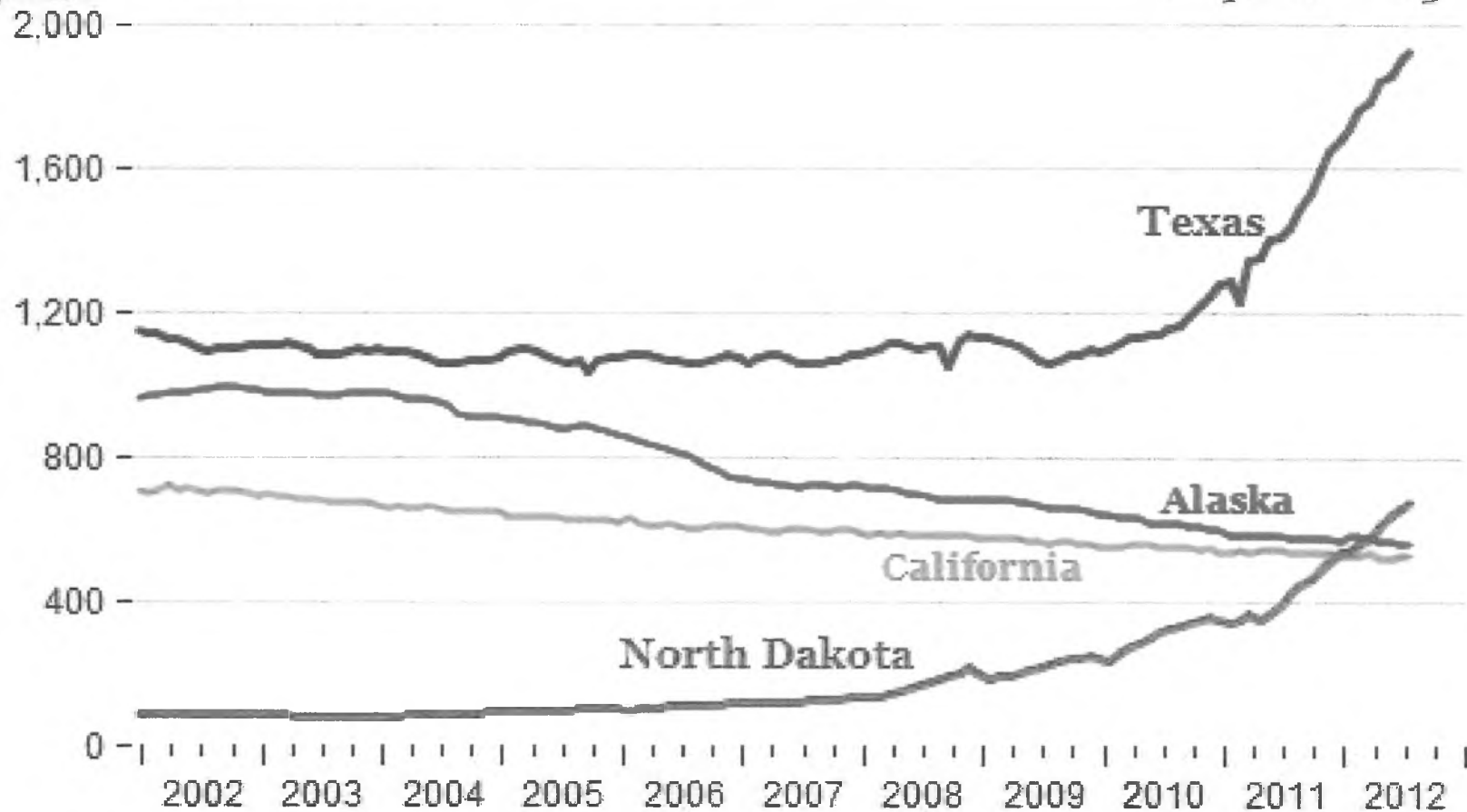
Alaska Headed Out of Medal Contention – 4th

Daily Oil Production in the Top 4 U.S. Oil-Producing States, 2002-2012

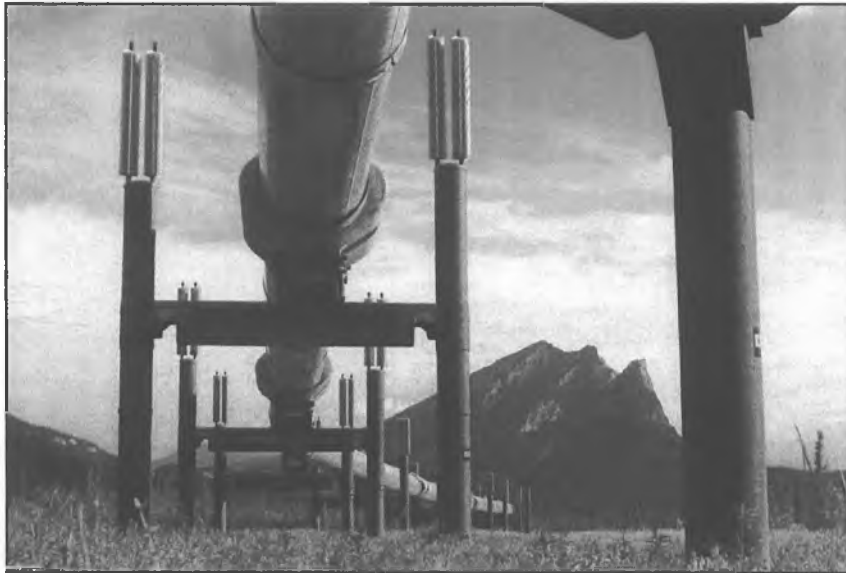
Thousands of barrels

Source: EIA

Carpe Diem Blog



Trans Alaska Pipeline System



- Approximately 11 percent of the nation's domestic oil production carried on TAPS.
- Nearly 17 billion barrels of crude oil transported.
- 20,000+ tankers loaded.
- 547,000 barrels throughput per day, 2012 average.

Refining in Alaska



Cook Inlet



Apache



Hilcorp Alaska, LLC



Marathon Oil
Marathon Alaska
Production LLC



TESORO

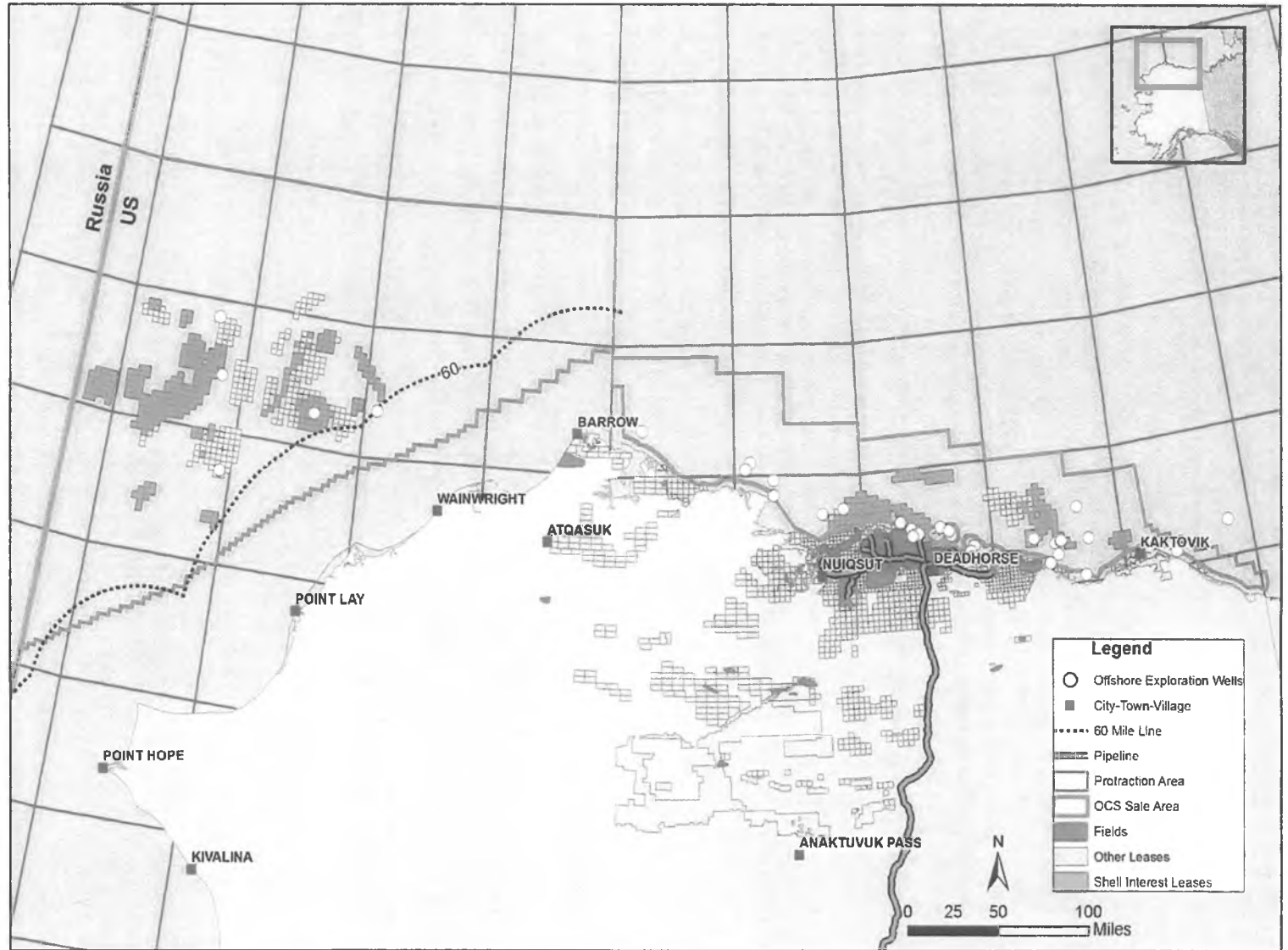
XTO
ENERGY

AOGA | Work Together. WIN Together.

Arctic Offshore Potential



Statoil



AOGA

Work Together. **WIN** Together.

North Slope Onshore

Great Potential:

- 40 bbo in Arctic
- 5 bbo recoverable in existing fields
- 2 bbo potential Unconventional



PIONEER
NATURAL RESOURCES ALASKA



petroleum

ExxonMobil



AOGA | Work Together. **WIN** Together.

Governor Lays out Principles for Oil Tax Reform

Anchorage Daily News, Jan. 6, 2013:

Reform must:

- Be fair to Alaskans
- Encourage new oil production
- Be simple and restore balance
- Be durable and long-term in nature

AOGA Thoughts on SB 21

- Support the proposed elimination of progressivity
- Concerns with how the bill addresses tax credits
- Support the concept of gross revenue exclusions but should be expanded to fit the majority of projects in legacy fields
- Represents cornerstone for significant and crucial tax reform
- Stand ready to assist in achieving a long-term policy for Alaska

Alaska Oil and Gas Association



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Kara Moriarty, Executive Director

ALASKA OIL AND GAS ASSOCIATION STATEMENT ON SENATE BILL 21 FOR SENATE SPECIAL COMMITTEE ON TAPS THROUGHPUT

February 5, 2013

Good Afternoon. For the record, my name is Kara Moriarty and I am the Executive Director of the Alaska Oil and Gas Association, commonly referred to as "AOGA". AOGA is the professional trade association that represents 16 member companies who account for the majority of oil and gas exploration, development, production, transportation and refining of oil and gas onshore and offshore in Alaska. These comments regarding SB 21 have been reviewed by all members and were approved unanimously.

Senate President, Senator Charlie Huggins, outlined the Senate's priorities in an opinion piece published in the *Anchorage Daily News* on January 31. In it he stated "the most pressing issue facing Alaska is the downturn in oil production on Alaska's North Slope." We couldn't agree more. In fact, that is why this committee has been formed; to investigate the causes of oil production decline and make recommendations to turn the tide. We applaud Senator Huggins, you and Governor Parnell for recognizing this as a serious issue.

You have seen this chart over and over, but I think it's important to reflect on this decline. When I was legislative staff in 2000, the first year of this chart, no one was talking about production decline. Instead, everyone was focusing on price, because even though we had a million barrels per day of production, prices hovered between \$8-10 that year. The state was facing a \$1 billion shortfall, at a time when the budget was significantly less than it is today.

This is the updated forecast from the Department of Revenue (DOR) and you will see that they have employed a new risk modeling into their forecast. In the past, DOR projected that 10 years from now 50% of our oil production would be from new oil. While we applaud DOR for providing a more likely and realistic projection, it is important to note that their forecast for currently producing fields assumes that the current level of investment in producing fields will continue, which is by no means guaranteed.

Regardless, the fact is Alaska's production decline rate has remained at around 6% per year for the last decade, or at least 40,000 barrels a day per year. While we have never said that oil production will return to historic levels of 2 million barrels per day, we continue to argue that this accelerated decline is unacceptable, especially at a time of record and sustaining high oil prices over the last five years.

And just how is our competition reacting to high oil prices? This slide shows the oil price in the green dotted line and production from other regions, including mature basins like ours. Production in Texas started to level off as prices increased, and this was before the shale explosion. And of course, I don't need to remind you about North Dakota on the bottom of the graph that has caught up and surpassed us in production.

But another state that is about to surpass us is California. As this slide says, we are headed out of medal contention. We barely have the bronze and are about to slip to the fourth largest producing state in the United States. In fact, we now supply only 8% of the nation's oil production. I shared similar statistics with you at our legislative luncheon, but I think they bear repeating. In November 2012, the most recent month of statistics on the U.S. Energy Information Agency's website, production in Texas was 2.1 million barrels per day, North Dakota was 731,000 bpd, Alaska was 553,000 and California was nipping at our heels at 533,000. This at a time when we still have world class resources.

As you know, I represent a diverse membership, ranging from companies exploring and operating in Cook Inlet and on the North Slope, to companies hoping to develop Arctic Outer Continental Shelf resources, to three in-state refineries and our lifeline, the Trans-Alaska Pipeline System – or TAPS.

Current production is over 100,000 bpd less than when production from the North Slope began in 1977, so one company in particular that would love to see more oil through TAPS is Alyeska Pipeline Service Company. Because of the dedication and efficiency of their employees, we don't hear about the increasing day to day demands and challenges Alyeska faces in providing safe and reliable transportation of our resources to market, but you are going to hear about them in detail from the president of Alyeska following my presentation.

But it's not just Alyeska. Every single one of my members shares your concern about the decline in TAPS, and for good reason. Two of the three in-state refineries rely solely on North Slope crude, delivered through TAPS, for their refineries. And it is no secret the challenges our refiners face. Low throughput has increased the costs of refining, especially in Interior Alaska. For example, about 20 years ago, the oil when it reached North Pole refineries was about 110 degrees Fahrenheit. Now, it comes in in the mid 30 degree range. So in the refining process of heating oil to over 600 degrees F, the Interior refineries are expending considerably more energy to heat the oil an extra 70 degrees or so due to the drop in throughput, and it is no secret the cost of energy is extremely high in the Interior.

And even though my members in Cook Inlet may seem far removed from this issue, successful operations on the North Slope affect their businesses as well. As skilled workers, especially those with drilling experience have left Alaska for areas that are booming, now that Cook Inlet is starting to experience a boom again, it has been challenging to get drilling equipment and workers back to the Inlet.

As we look to the next generation of oil and gas development, the Arctic OCS is believed to have an estimated 27 billion barrels of oil and 130+ tcf of natural gas. But, even if we have a successful exploration season in 2013, it will be 12-15 years before we see production from the Chukchi Sea. Our pipeline needs to be healthy and viable then, as well as today and the time in between.

My remaining member companies are exploring, producing and operating on the North Slope. These producers of the existing non-legacy fields on the Slope, and the developers of any new fields that may be discovered, need as much production as possible flowing from the legacy fields through TAPS in order to keep the costs affordable to ship their oil from the Slope to its

refinery destinations. Unaffordable high transportation costs could cripple the economics of any new fields that might be found, as well as economics of non-legacy fields currently in production.

We have used this analogy before, but it still rings true. The North Slope oil province is like a tree, with the two great legacy fields being its trunk, and with the other fields being branches rising out of the trunk. If one peels the bark off all the way around the trunk and make it unhealthy, all the other branches will become unhealthy too, no matter how robust they might have been if the trunk stayed strong.

Governor Parnell recognizes that as a state, we need increased oil production from all fields because the current throughput is unacceptable. He has identified four “core principles” that “any tax reform proposal must adhere to”:

- “First, tax reform must be fair to Alaskans.”
- “Second, it must encourage new production.”
- “Third, it must be simple, so it restores balance to the system.”
- “Fourth, it must be durable for the long term.”

AOGA endorses these principles. As you work through this bill and throughout the session, we also encourage you to ask yourselves:

- What is the state’s goal and desired outcome?
- Does the state’s policy reflect the constitutional mandate of developing the natural resources here for the maximum benefit of Alaskans, both today and tomorrow?
- Is the policy short, mid or long term?
- Will it encourage additional investment across a wide spectrum of projects/companies?
- Will it encourage development through a fair and predictable regulatory environment?
- Will it encourage development through land sales and competitive lease terms?

The challenge facing Alaska is not in having too many companies pursuing the opportunities that they see here, but in having too few. To be effective, any reform measure needs to avoid tax changes that artificially create “winners” and “losers”.

Senate Bill 21 takes some positive steps towards the goal of more production; such as the Gross Revenue Exclusion concept and eliminating progressivity, which has led to Alaska being uncompetitive. There are some other provisions that need further consideration in order to fully achieve the goals set out in this legislation.

We support the proposed elimination of progressivity. We have reservations with what the Bill proposes for tax credits – most importantly with the proposed repeal of tax credits for qualified capital expenditures (QCE). The trade-off between repealing progressivity and losing the QCE credit is not beneficial to industry with a rising cost structure and low oil price environment, although it would be helpful with high prices.

We strongly support the GRE (gross revenue exclusions) concept but have concerns over its limited applicability to new fields, only, which is further compounded by the loss of QCE credits as a driver for additional investment. We believe the GRE and tax credit restructuring proposed in the Bill could and should be expanded and better tailored to fit the majority of projects for “legacy” fields that would increase the amount of oil and gas from them.

We also believe the reasons that led the State to create the small-producer tax credit under AS 43.55.024 are still valid, and we are pleased the Bill will extend this credit from 2016 to 2022. But the reasons for creating the exploration tax credits under AS 43.55.025 are also still valid today, and the Bill would be improved by extending these tax credits or making them permanent. Similarly, the Bill would also be improved by addressing the upcoming end of the tax caps for Cook Inlet production and non-Cook Inlet gas sold for in-state use, which will otherwise occur at the end of 2021. Addressing these known issues now, before they become imminent, would strengthen the durability of the reformed tax.

The members of AOGA desire the same outcome that the Governor and the People of Alaska want – more oil in the pipeline providing a solid future for our industry and continued revenues to the State for the benefit of all Alaskans.

Our member companies want to do business in Alaska. Some have been exploring and producing in Alaska for decades, while others have arrived more recently. Both groups have a strong desire to be able to remain in Alaska long-term for their own and the State’s mutual benefit.

Overall, the Bill as introduced represents a cornerstone for significant and crucial tax reform. It will take a monumental effort just to replace oil from declining fields with a mixture of new production and new stimulation to legacy fields, and bring the decline to a stop. AOGA stands ready and willing to help Alaskans, the Governor and this Legislature in the remaining work to achieve the four “core principles”. We all need to work together to make this happen.

3700 Center Point Drive

Anchorage, AK

February 5, 2013

Testimony to Senate Special Committee on TAPS Throughput (Senate Bill 21)

Co-Chairs Senator Micciche, Senator Dunleavy and Senators on the Committee:

My name is Douglas Smith, President and CEO of LRS Inc and President of the Alaska Industry Alliance.

Thank you for your service to the people of Alaska and working the difficult issue of increasing TAPS production.

The Alliance represents Over 400 member companies and 35,000 Alaskan Workers.

LRS is a Hot Oil business with 148 employees working on the North Slope.

I am testifying on behalf of the Alliance.

The alliance supports the framework of SB 21 and the intent of the Governor to make Alaska competitive for additional investment and increased oil production.

Production is down 27% since 2007 despite continued high oil prices

Total Capital spending has been flat since 2008 and when adjusted for inflation a decrease year to year since 2010. For the large producers, and the bulk of where our oil comes from, the capital spend in 2012 is \$62 million less and \$100 million less when adjusted for inflation.

Some have focused on new entrants to the North Slope and despite capital spending that is equal to 50% of the large producers the group accounts for less than 10% of the production and some of that is inside mature units.

New unit production, those producing after 2003, are less than 5% of daily production. Despite the high investment and limited production gains the new entrants are a key component of Alaska's future and have provided not only additional production but A significant boost to our local economy by spending 100s' of millions in the state while others have reduced spending. These new entrants have more opportunities and our tax policy must continue to support their development efforts. As we try to stem the decline it is the aggregate production gain that matters when discussing the new developments.

The easy oil is gone and the cost to develop new sources of oil is many times that of earlier developments. Alpine was developed for a billion dollars and delivered 80,000 barrels per day but now CD5 will cost a billion dollars and deliver 18,000 barrels under a very different and less profitable tax policy.

In 2005 179 wells were drilled on the North Slope while ANS crude was \$51 per barrel. In 2012 we drilled 140 wells, a 25% reduction despite oil prices topping \$100. ACES is working if we are harvesting and have given up on the long term potential of our oil resource the pathway to LNG development and the next generation of Alaskans economic prosperity.

We are 3 years into a rigorous debate on our tax policy while production continues to decline and some Senators tell us that ACES is working. Senator Wielechowski who wants to debate the Governor on oil tax policy along with Senator Ellis would like to bring back Gaffney, Cilne and Associates who worked on ACES to advise legislators. That group produced graphics in 2007 that show Capex for drilling at 3.7 billion from 2008 to 2012 and incremental oil of over 200,000 barrels per day by 2012. Given the inaccuracy of that forecast of how our oil and gas investment and corresponding production has turned out I would not listen to the Senators in question or the consultants they would like to have advise legislators on tax policy. The work provided by econ One and PFC Energy is comprehensive and provides the information necessary along with testimony to move forward with legislative decisions.

We cannot waste more valuable time on fool hearted follies or consultants that steered us into this path of declining investment while our oil producing peers have seen extraordinary growth, prosperity and increased production. Despite an aging field environment Texas has seen a production increase in the last 10 years while our production has dropped 40%. It is long overdue to correct our tax policy and make Alaska competitive for the investment needed to sustain our oil production for the long term.

Senate Bill 21 is a good start to achieve this goal however we suggest the following considerations:

- 1) Ensure our tax policy adjustments do not increase taxes in the range where producers will stress test the economics of investment opportunities, thought to be in the \$80 -\$85 range.
- 2) Ensure our tax policy does not disincentive development within existing PA's where the largest production improvement opportunities exist.
- 3) Oil policy must support the new entrants like Pioneer and ENI who are producing oil into TAPS and spending millions in our state economy. Our policy must encourage them to continue that investment trend.
- 4) A new tax policy must make Alaska competitive for investment but protect Alaskans interest. A fair and balanced approach will be durable.

We urge you to act fairly but expeditiously on this legislation and allow Alaska to become more competitive in investments for new oil production.

Chairmen and Senators, thank you again for all of your efforts.

Senate Special Committee on TAPS Throughput

SB21

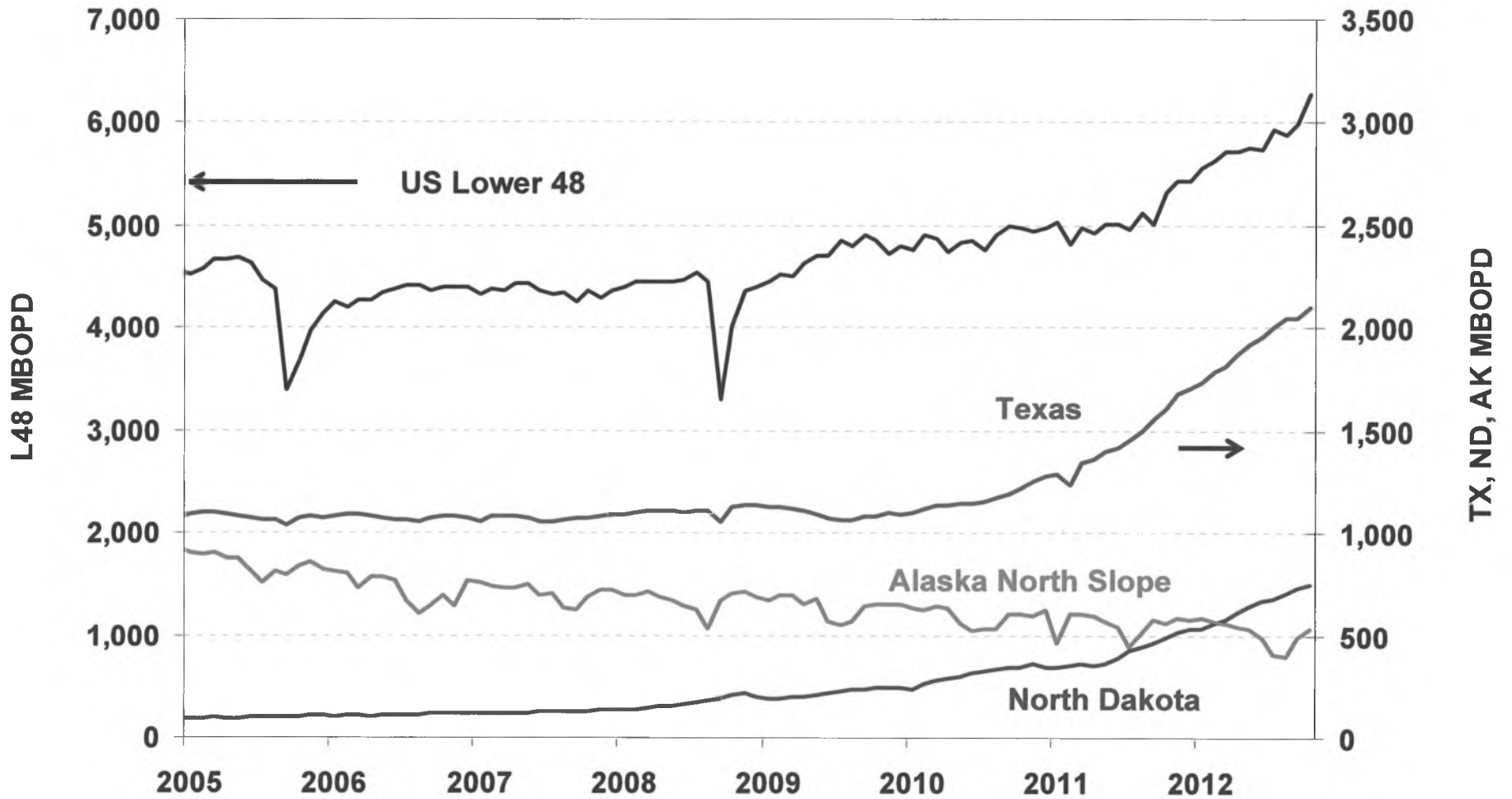
Bob Heinrich, VP Finance
Scott Jepsen, VP External Affairs
ConocoPhillips Alaska

February 5, 2013

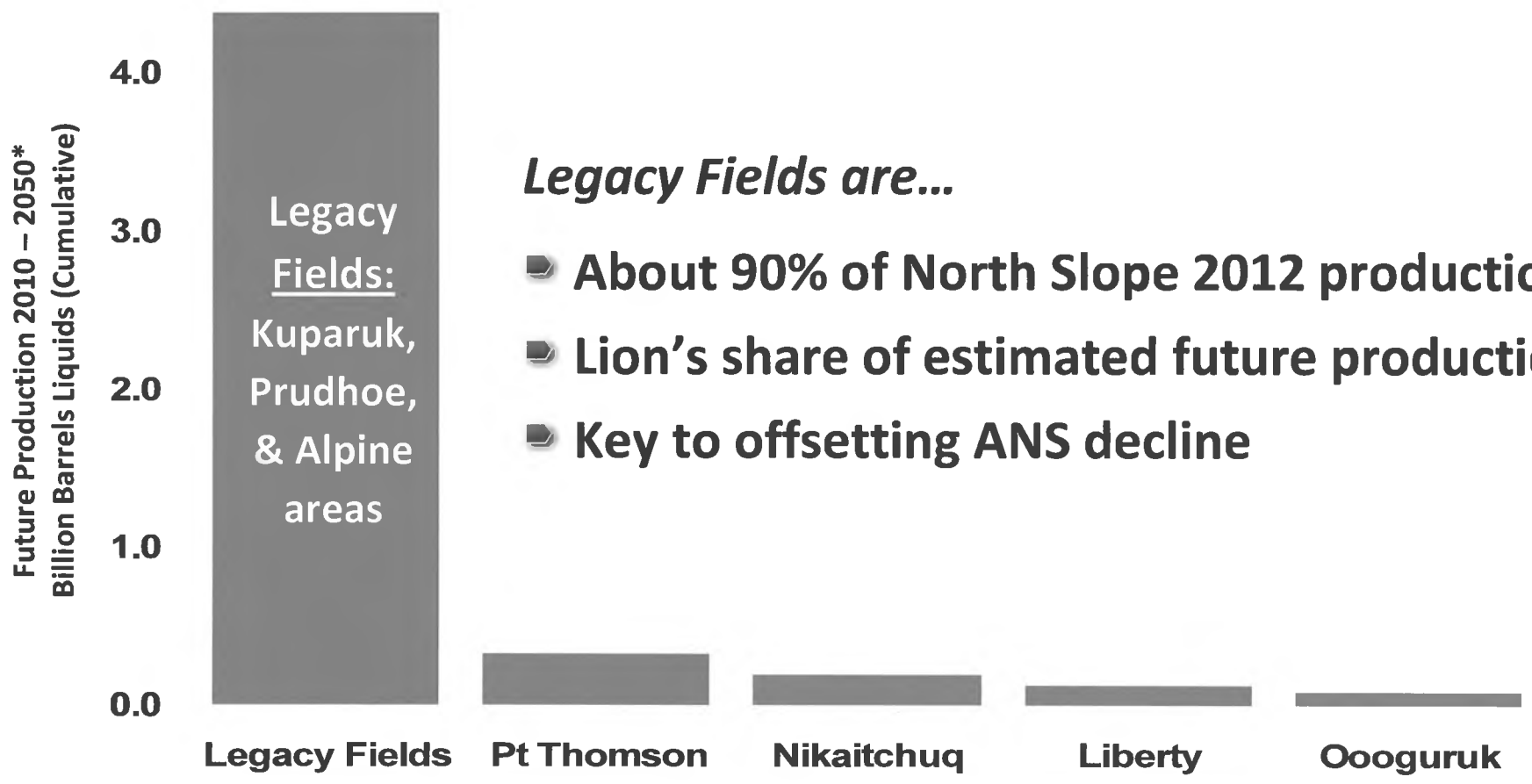
Topics

- Alaska's Production Challenge
- Investment Considerations and Alaska's Cost Environment
- ACES and SB21
- Observations

Alaska Decline Continues While Lower 48 Continues to Increase



Alaska Legacy Fields Still Provide Significant Opportunity

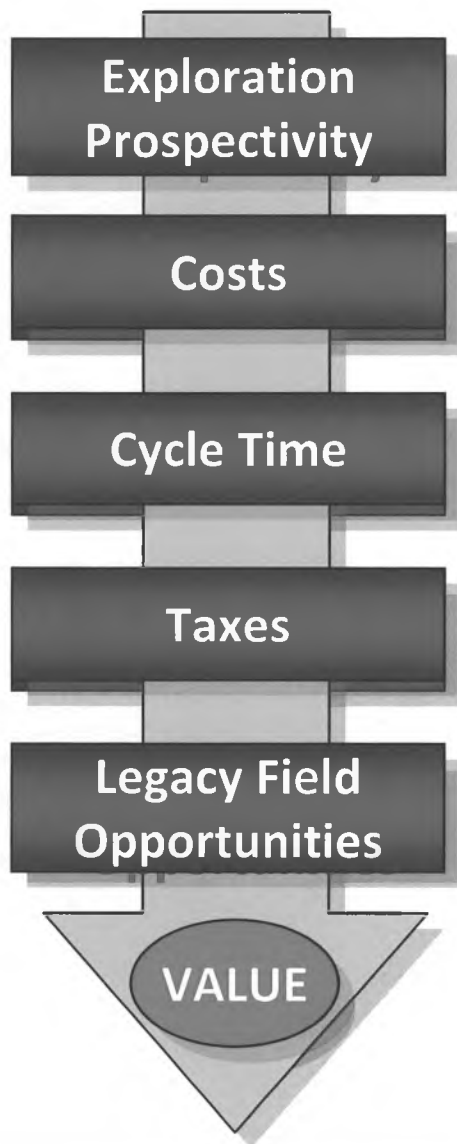


Legacy Fields are...

- About 90% of North Slope 2012 production
- Lion's share of estimated future production
- Key to offsetting ANS decline

*Source: DOR 2009 production forecast 2010 – 2050 volumes

Investment Criteria: How Alaska Ranks



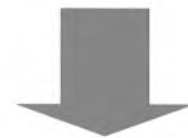
- Expected field size/maturity
- Crude quality

- Exploration, development & production cost
- Transportation costs to market

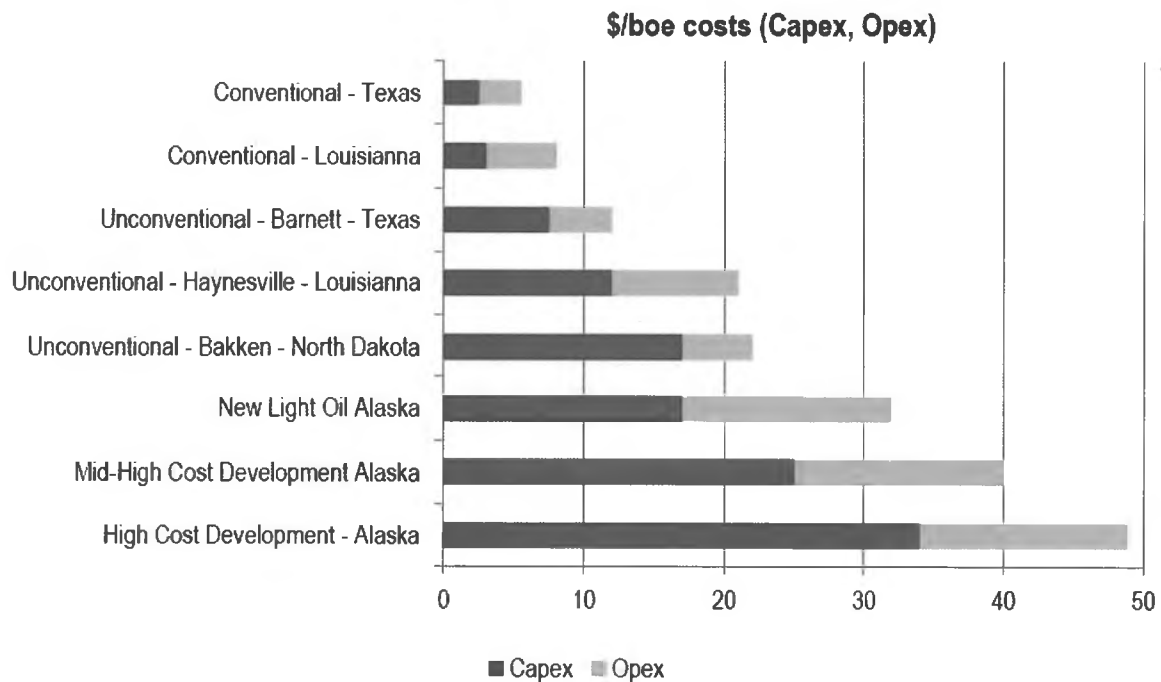
- Time to production
- Permitting/regulatory environment

- Tax rates given challenged location
- Tax rates compared to other states & countries

- Billions of barrels left to be developed
- Significant production volumes



Alaska's Days of "Easy Oil" Are Gone: High Costs and High Government Take Present Challenges



Costs are significantly higher in Alaska than the Lower 48 – even compared to unconventionals. Meanwhile, Alaska's Government Take has risen significantly over recent years, meaning new project economics can be very challenging

“Easy Oil” In the Legacy Fields Is Gone

- Challenged oil remains
 - Complex, high cost wells
 - Smaller reserve targets
 - Isolated fault blocks, flank oil
 - Satellites and viscous oil
 - Most new wells produce oil AND water
 - Facilities handling ~ three times as much water as oil
- **A billion dollars does not go as far as it used to...**
 - 2000 Alpine development:
~80,000 BOPD
 - 2012 CD-5 Drillsite:
~18,000 BOPD



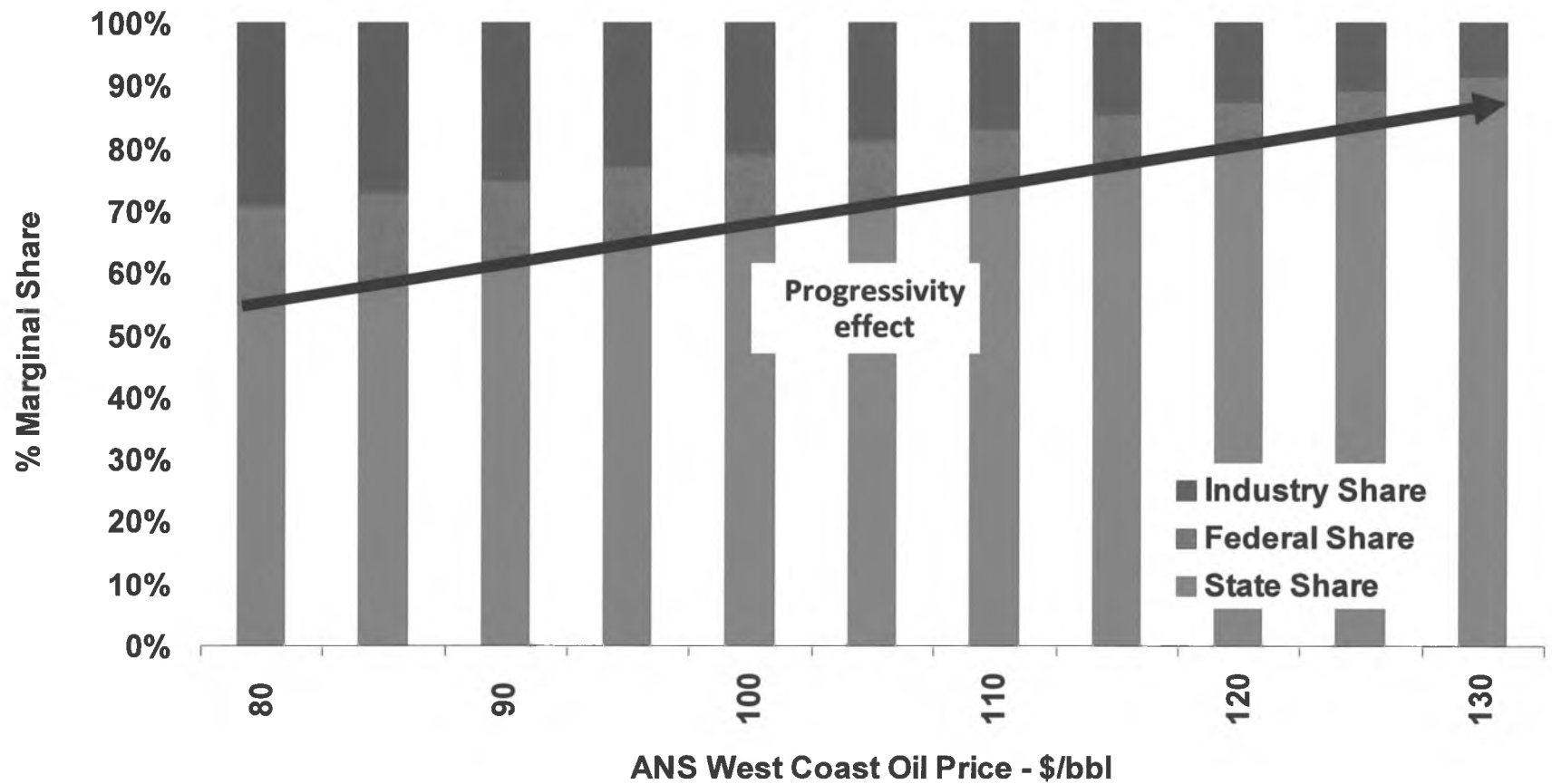
Initial Alpine Development



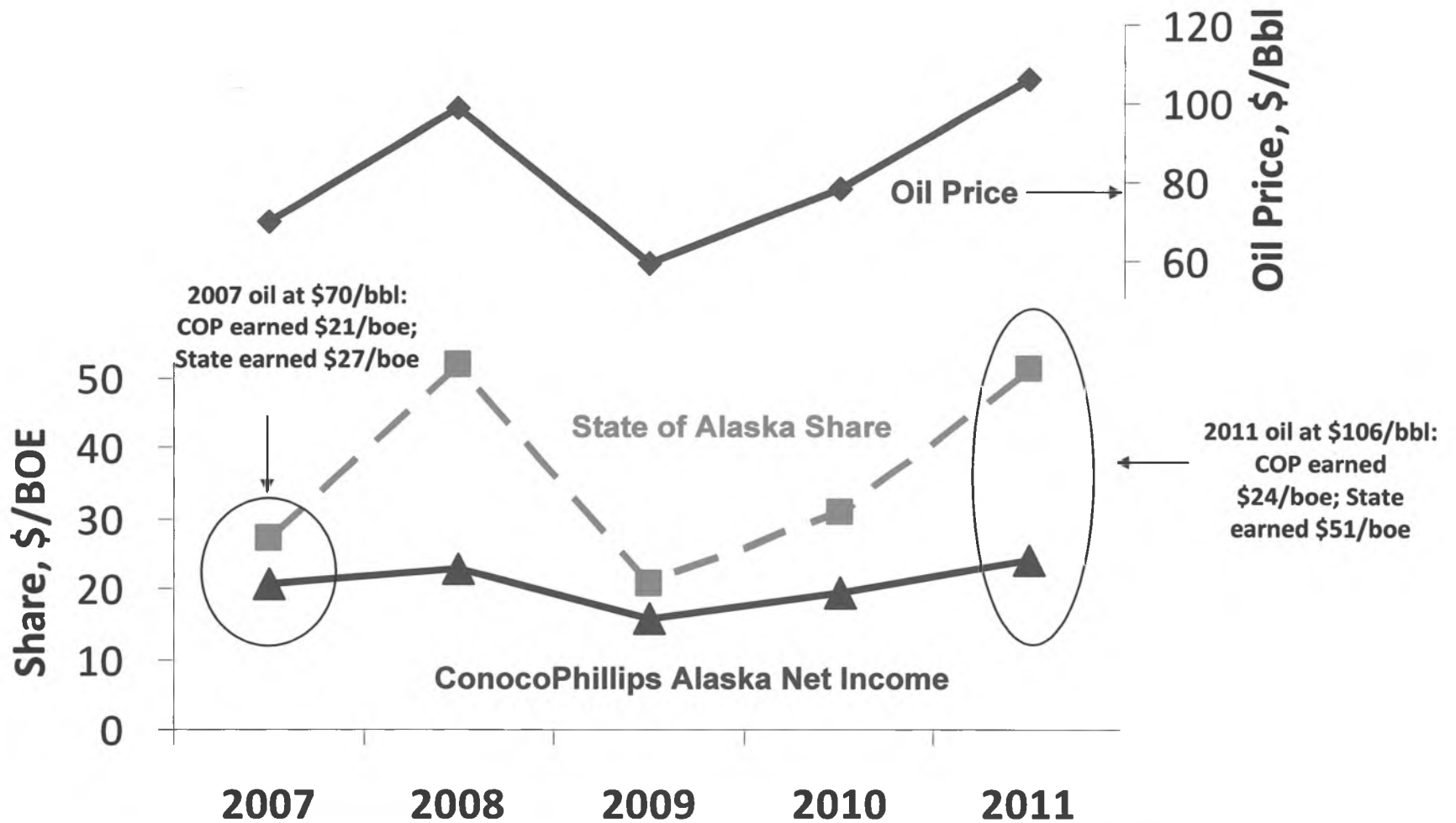
CD-5 Type Development

ACES Marginal Industry Share

Government and Industry Marginal Share in Alaska



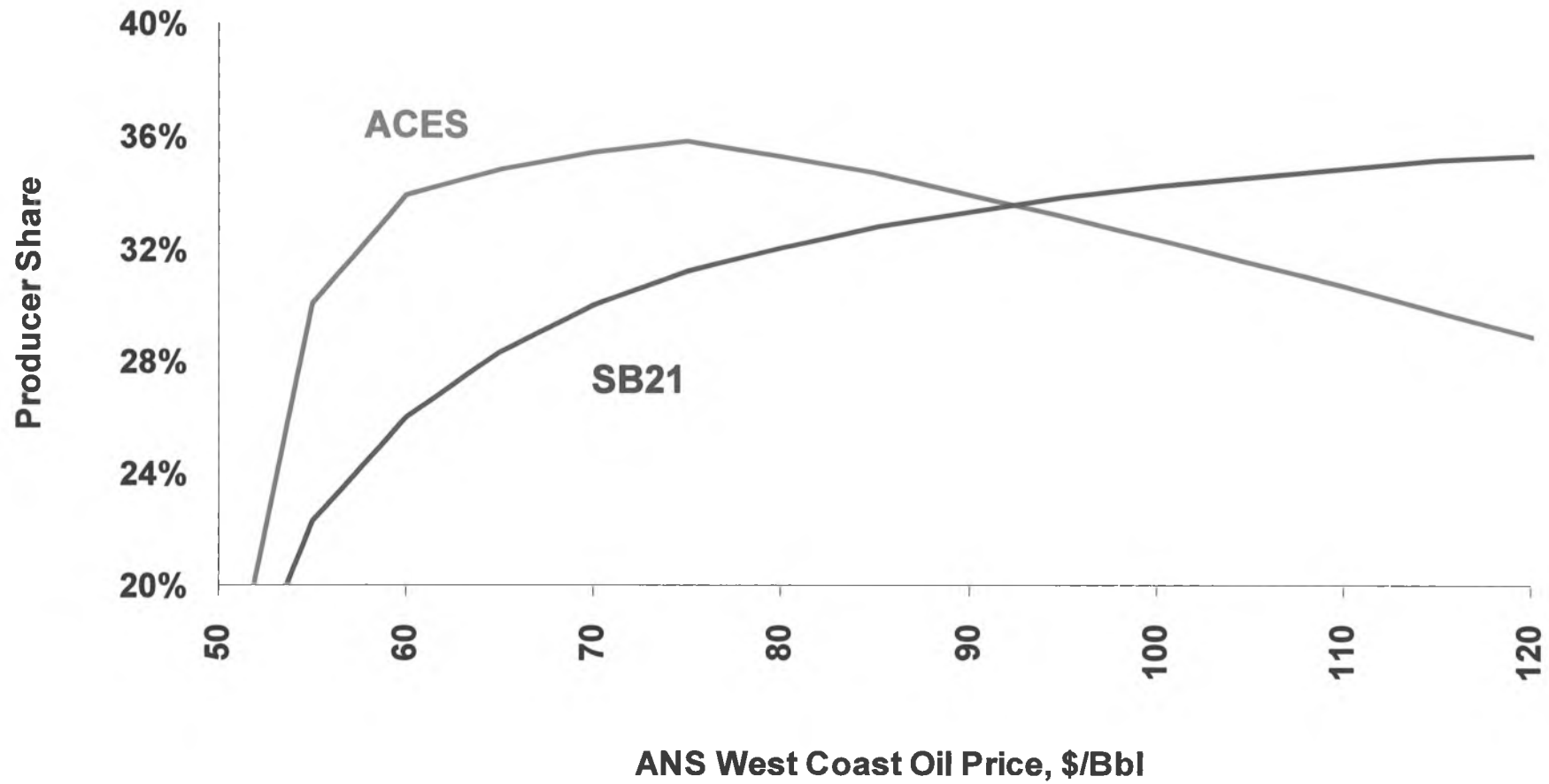
Earnings Per Barrel – ConocoPhillips Alaska and State of Alaska



ACES progressivity takes the upside

Source: ConocoPhillips 10-K, 2007-2011; State share is royalties (estimated), production tax, ad valorem tax and state income tax, oil prices are average realized prices by ConocoPhillips on the West Coast

Producer Share under SB21



Observations

- ACES

- Progressivity takes the upside and discourages investment
- Tax credit investment incentives positive, but do not offset the negative effects of ACES progressivity

- SB21 Positive Elements

- Positive step to improve Alaska's business climate
- Solves the high marginal tax problem
- Makes Alaska more competitive at \$100+ prices

- SB21 Areas for Improvement

- Bill does not contain sufficient investment incentives for legacy fields to offset Alaska's high cost environment
- Does not encourage investment relative to ACES in a downward trending oil price environment

Basis shows
3 Barrett
documents - they
are all contained
in this one
document

Trans Alaska Pipeline System

*Declining Throughput Challenges
Senate Special Committee on TAPS Throughput
February 5, 2013
Presented by Tom Barrett, President*



About TAPS

TAPS was designed as a warm oil pipeline.

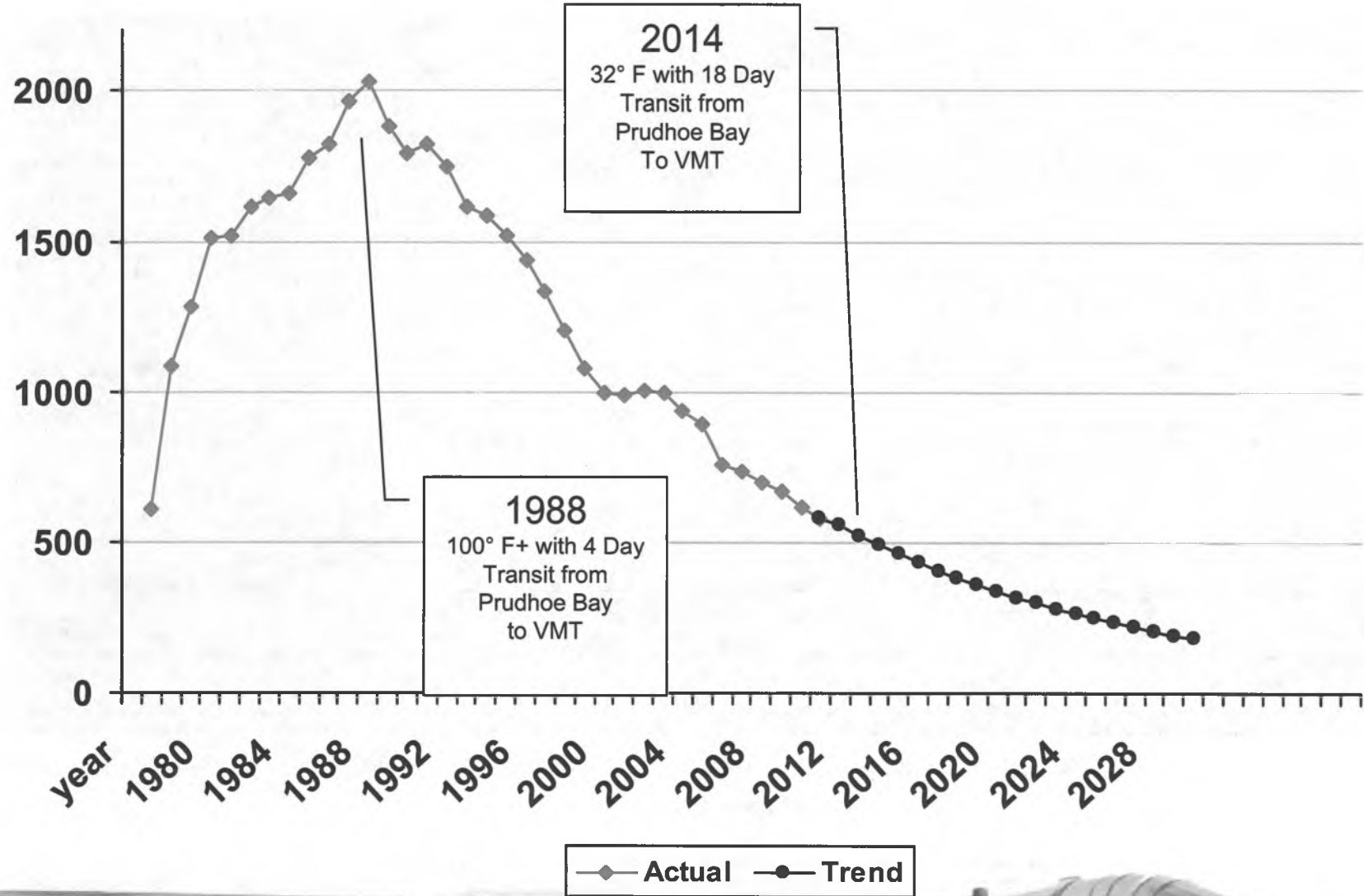
- Designed to move 1.5 million barrels per day.
- Peak production of 2.1 million barrels per day (1988).

Circumstances have changed.

- Throughput and temperatures continue to decline.
- At 580K barrels/day, segments of crude oil in the pipe will be below 32F during the winter months.



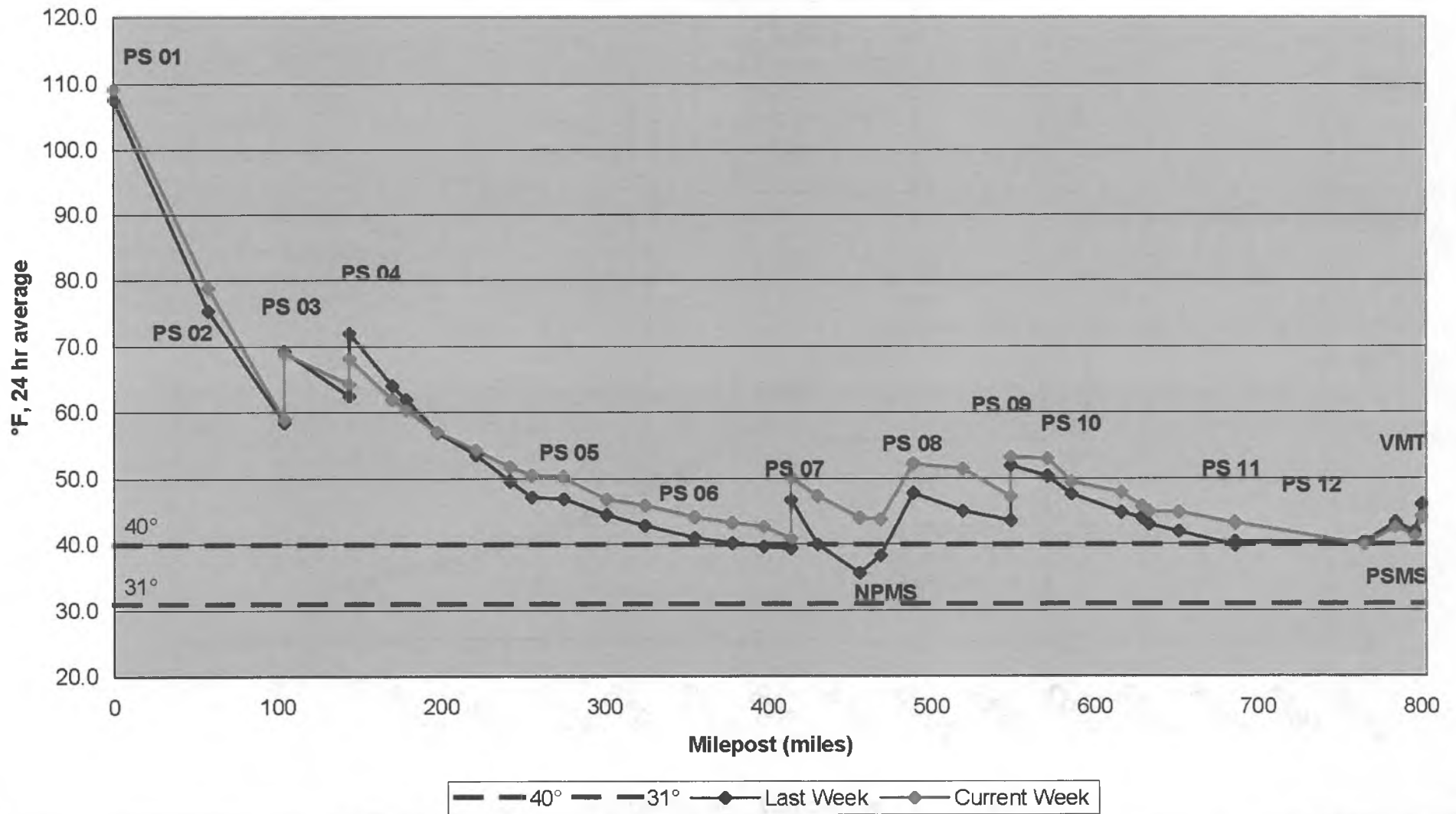
Steadily Declining Throughput



Adjusted Pipeline Temperatures

24 Hour Average Adjusted Temperatures for January 27 and February 3, 2013

The adjusted temperatures have an offset applied to the values based on the temperature data gathered from PDL (Pipeline Data Logger) runs.



TAPS scraper pigs



Taking action today, preparing for tomorrow



Recirculation pipe installation at PS4



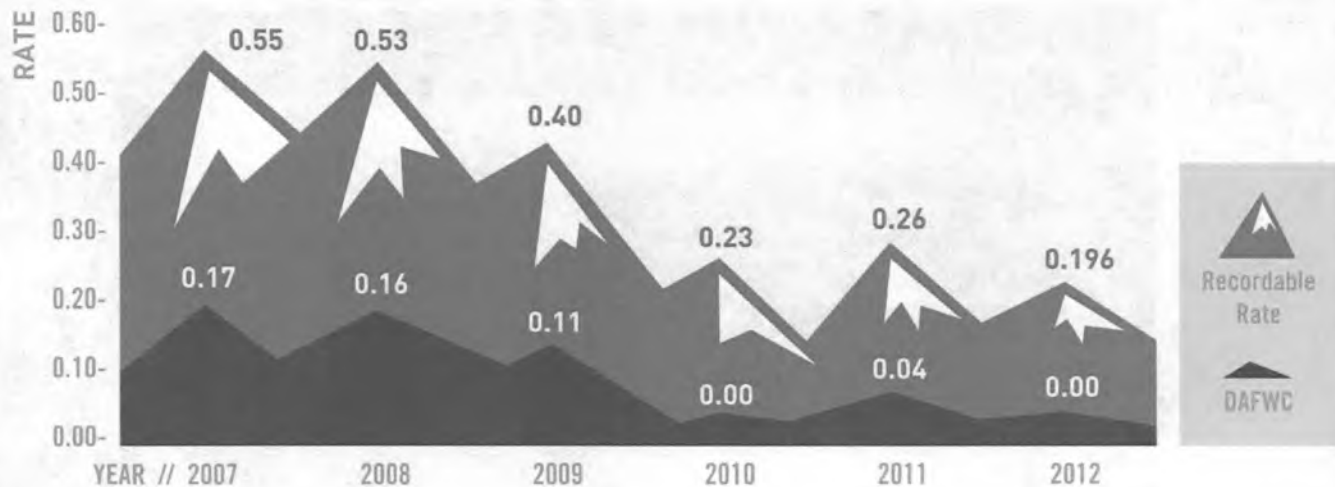
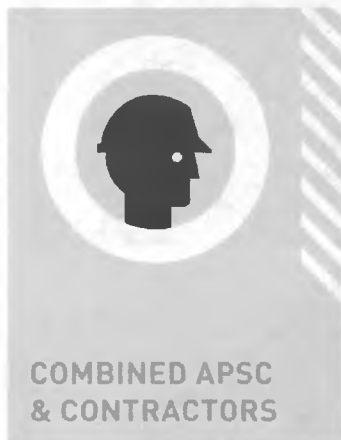
Determination, ingenuity, partnership



2012

Alyeska's BEST safety year on record

OCCUPATIONAL SAFETY



99.8 % reliability delivered for the State of Alaska



“We didn’t know it couldn’t be done.”





Declining throughput: a continuum of challenges

The trans-Alaska pipeline transformed Alaska's economy and strengthened the nation's energy infrastructure. The pipeline today transports some 11 percent of the nation's domestic crude production and remains the backbone of Alaska's economy, delivering about 90 percent of unrestricted general fund revenue.

More than 2 million barrels a day (BPD) once surged through the Trans Alaska Pipeline Systems (TAPS). Since peak flow in the late 1980s, TAPS throughput has dropped. Today it is declining more than 5 percent per year. Less oil means slower-moving oil. Slower oil means colder oil. And the slower and colder the oil, the more complicated the challenges for Alyeska Pipeline Service Company, the pipeline's operator.

The best long-term solution is more oil. In the meantime, daily throughput is already lower than it was at pipeline startup in 1977.

Water/ice

Crude oil naturally contains small amounts of water. As crude slows and cools, water will begin to separate out from the oil and accumulate at the bottom of the pipeline, increasing the risk of corrosion. This happens today during shutdowns, when water accumulates at low points. As water drops out and everything cools, the risk of ice-related problems also increases.

Wax

ANS Crude oil naturally contains up to 2 percent wax by volume. There are two issues with wax: First, when the pipe walls are colder than 70 degrees and colder than the oil, wax crystals gravitate to the pipe wall and stick to it. Second, wax precipitates out of the crude oil. Less turbulence, cooler crude temperature and slower flow all may result in more wax sticking to pipe walls and more wax dropping out of the oil and settling in the pipeline. Wax deposits must be removed by running cleaning pigs.



Less throughput = more challenges

Less oil → slower flow → crude spends more time in pipe, and less turbulence
Slower flow/less turbulence → more wax may accumulate in the pipe, requiring more frequent 'pig' cleaning
More time in pipe → Crude loses heat → higher risk of ice problems, more wax forms

- TAPS is currently moving an average of 548,000 BPD (2012 daily average)
- Challenges are immediate
- No hard and fast thresholds; a continuum of challenges requires corresponding actions to address them
- Ultimately may need shift to intermittent flow



The pipeline today

Alyeska and its owner companies have analyzed the risks, options and challenges of declining throughput. Some mitigations are already in place, while engineers are validating other potential steps through laboratory and field tests.

Transitional fix: more heat, more pigs

For the immediate future, Alyeska is adding heat to keep the crude warm and to prevent small amounts of water from freezing in the line. The cleaning pig program has been modified – with frequent pigging and redesigned pigs as needed – to keep the pipe clean of wax.

Heat is added through recirculation at Pump Stations 3, 4 and 9. Pump Station 7, which was previously decommissioned, is now back online to recirculate oil. Infrastructure for recirculating oil at that station is also enhanced. A schedule is in place for adding more heat as the crude continues to cool due to declining throughput.

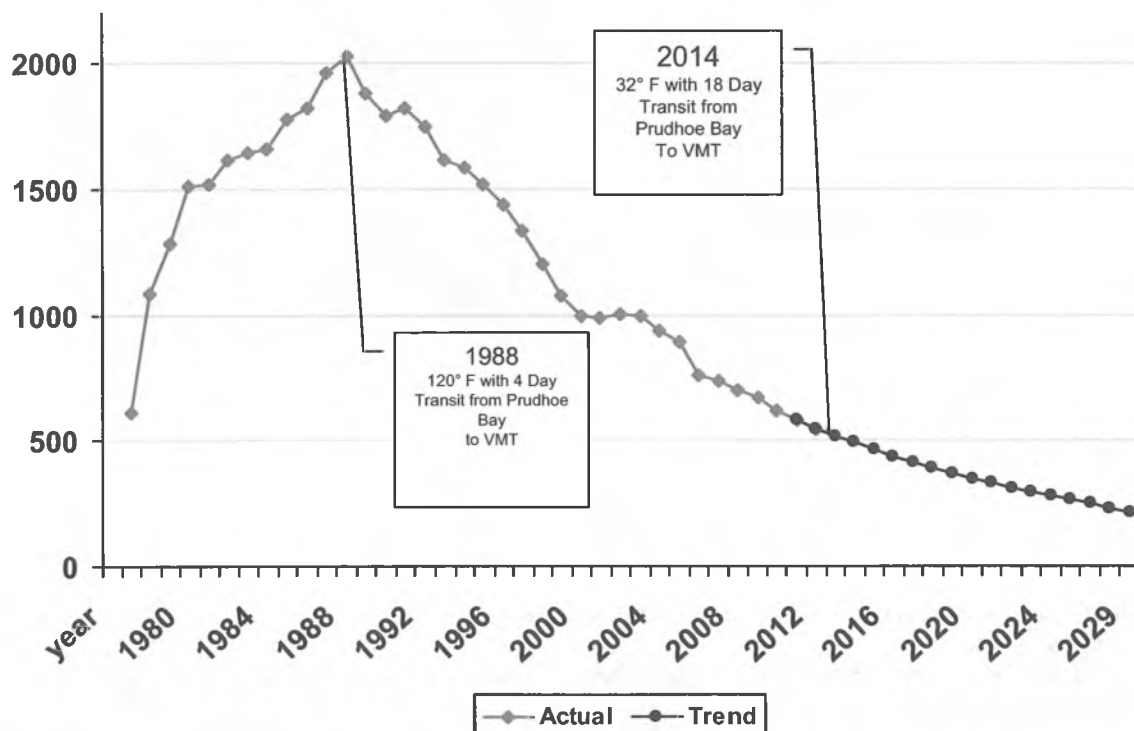
Longer term: cold dry flow

As throughput further declines, continuing to add ever more heat would create new problems. At some point – teams are researching this now – it appears the most effective approach will be to operate the line in a “cold-dry flow” state.

With cold-dry flow, most of the water is removed from the crude before it enters the pipeline and the system runs much cooler. Since the purpose of heat is mainly to prevent ice formation, eliminating most of the water eliminates the need for elaborate heating systems.

Once the cold dry flow system has been validated through field and laboratory testing, a transition phase will shift the system from heat-dependent operations to cold-dry flow.

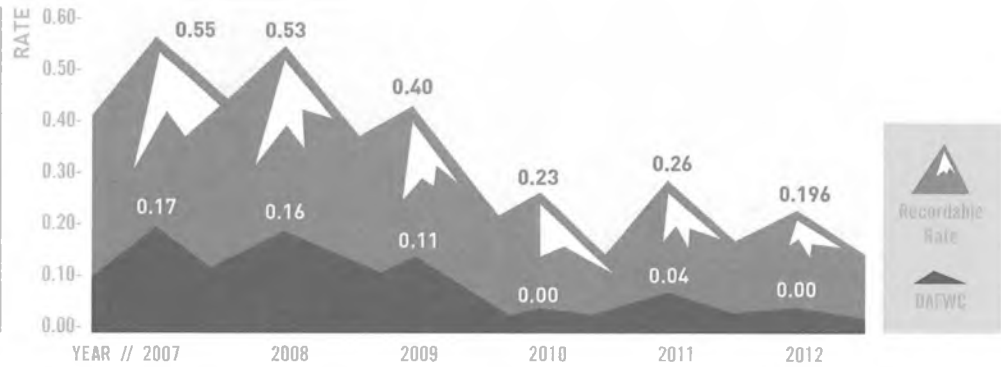
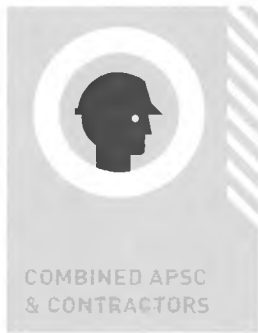
Work is in progress to determine how best to manage wax accumulation.



2012

Alyeska's BEST safety year on record

OCCUPATIONAL SAFETY



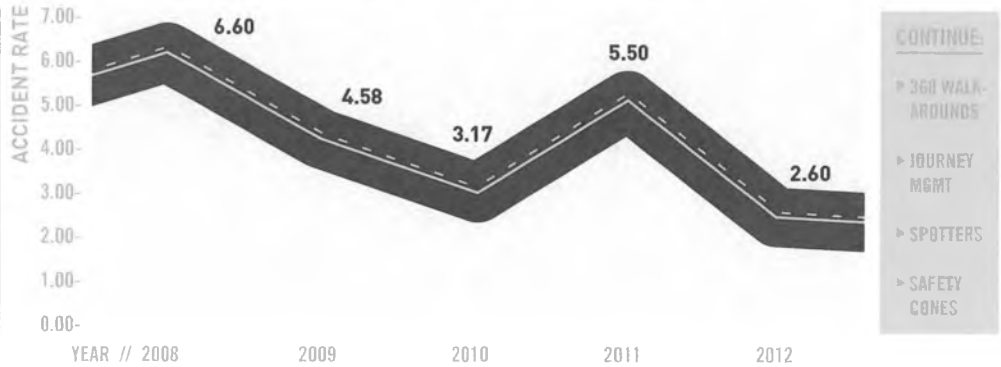
3 PART CONTRACTOR SAFETY IMPROVEMENT STRATEGY

ADOPTED IN 2012 & CONSISTS OF FOCUSED ACTION

- ▶ Reinforce *SAFETY CULTURE* expectations and accountabilities for TAPS Contractors
- ▶ Improve *LPS STEWARDSHIP* by Contractor and Labor Union leadership
- ▶ Increase *SAFETY ACCOUNTABILITY* for Contractor work on TAPS.

CONTINUE:
 ▶ HazRec
 ▶ LPS Behaviors

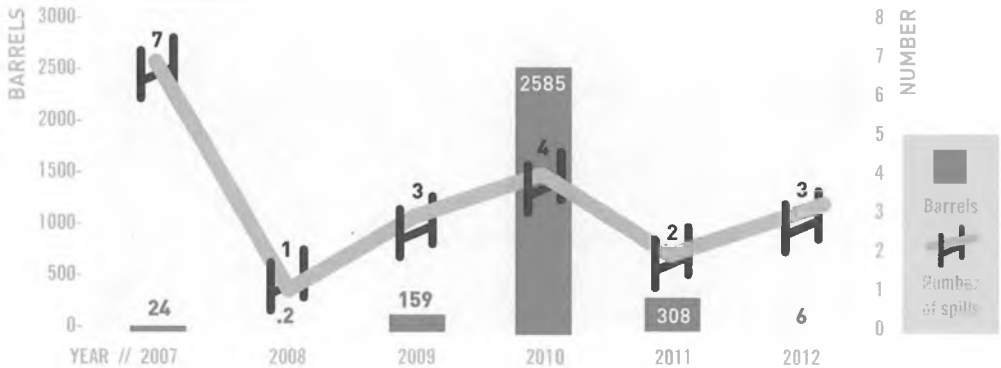
VEHICLE SAFETY



CONTINUE:
 ▶ 360 WALK-AROUNDS
 ▶ JOURNEY MGMT
 ▶ SPOTTERS
 ▶ SAFETY CONES

There were twelve PVA's incurred with the Alyeska vehicle fleet. All but one of the incidents were low speed impacts and relatively minor damage. One of the incidents involved a contractor operated Alyeska vehicle departing the roadway at highway speeds.

ENVIRONMENTAL



There were 3 "Performance Contract" spills. The total amount of petroleum product released was the lowest since 2008 (6 barrels).



PRESIDENT'S MESSAGE

As I write this, we are coming up on the 2012 Winter Solstice. The hours of dark are long, and deep cold is upon us. It is -51 degrees in Fairbanks today, and -31 degrees in Prudhoe Bay, with a wind chill to -49. We are just coming out of a stretch of early winter storms that challenged our inventory management at the Valdez Marine Terminal. With typical Alyeska grit, the employees and contractors of Alyeska Pipeline Service Company managed the Trans Alaska Pipeline System and kept oil moving safely through these conditions. I know this professionalism will stay strong as our six-month winter season continues.

The fact is, we know about operating a pipeline in a cold, challenging arctic climate. We've done this successfully for the past 35 years. But it has never been harder than it is today. With technical challenges from declining throughput, we are operating in new territory every day. Issues caused by declining flow – slower moving oil, more wax and water dropout, tank roofs to shovel – are becoming harder to manage in

the cold winter months. We're taking steps to address these issues and we will have to increase these efforts if flow continues to decline.

People on TAPS, whose focus and hard work make our winter operations successful, deserve our thanks. Since pipeline startup, our employees have worked very hard every day to safely move oil. We will continue to apply innovation and technology to continue that legacy, regardless of what the future brings.

TOM BARRETT
President



Tom Barrett speaks with Brendan LaBelle-Hamer, Pipeline Area Manager, and John Baldrige, Senior Pipeline Operations Director, during a visit to Pump Station 1.



PIPELINE 101 RECIRCULATION

In cold months, adding heat to cooling crude oil helps keep oil flowing. Alyeska engineers have modified or adjusted the Trans Alaska Pipeline System's pumping equipment to recirculate oil. Oil enters pump stations through the pipeline and is pushed downstream by the station's pumping equipment. With recirculation, the oil is looped back through the pumps several times. Recirculation adds energy to the flow of oil, and energy adds heat to the system. Oil enters TAPS at approximately 110 degrees and loses heat due to less velocity and longer travel time in the pipeline. With lower and lower throughput, recirculation is necessary to prevent freezing conditions in the pipeline. More oil equals more heat. Less oil means less heat, increased maintenance and cost, and the need for recirculation. See the featured story inside this newsletter to learn about recirculation work at Pump Station 7.



PIPELINE RELIABILITY DECEMBER 2012 RELIABILITY FACTOR

TAPS reliability factor for December 2012 **100.00%**
TAPS reliability factor for year 2012 **99.79%**

Barrels pumped from Pump Station 1

December throughput: 18,069,567 BBLS*
Average: 582,899 BPD**
Year 2012: 200,518,904 BBLS*
Average: 547,866 BPD**

*BBLS (barrels) = 42 Gallons **BPD = Barrels Per Day



VOICE FROM THE PIPELINE

Advice from Pump Station 7, where winter installation of recirculation equipment require extensive work outdoors: "Stay hydrated! We have to order two pallets of bottled water a week for the people working outside. The temperature change is hard. It can drop 20 degrees in 20 miles. Lots of contractors have never experienced freezing temperatures, much less -20 or -30 degrees. Hand protection is the biggest problem. You can spend \$100 on a pair of supposed arctic gloves and they're not worth a dime. Our guys have learned to build Taj Mahals out of Visqueen so the portable heaters can keep the outdoor work areas a little warmer. People's attitudes really depend on the meals; a good cook is worth their weight in gold."

FACTOID >

On Jan. 14, 1988, the highest daily throughput was recorded on TAPS – 2,145,297 barrels.



HEADLINE STORY

COLD WEATHER OPERATIONS ARE ESSENTIAL IN KEEPING TAPS RUNNING SAFELY AND EFFICIENTLY

To other Alaskans, “cold weather operations” means dusting off shovels and snow-blowers, and unpacking down coats for the winter ahead. For Alyeska employees, it means keeping TAPS running safely as oil transits the 800-mile pipeline during the coldest months of the year.



Throughput continues to decline and winter poses increasing challenges to a pipeline that was constructed to move a warm product quickly. Today, crude oil slowly moves through the frigid interior of the state, and it gradually cools. Without action by Alyeska, cold oil could create a host of different problems, from frost heaves to ice formation in the line. Ice could damage pumps and valves in facilities along the pipeline corridor.

To combat the problems caused by diminished flow rates and temperature, Alyeska employees are working to keep the pipeline running in a steady state during winter operations. This requires careful coordination of project work and other factors to minimize shutdowns during winter.

Alyeska also adds heat at strategic points along the pipeline. For two years, crude oil has recirculated at several pump stations, creating friction and heat as it travels through piping multiple times. At Pump Stations 4 and 7, teams installed additional piping and new valves that function partly open. These drag valves create significant friction; this system is called



IN THE FIELD

PUMP STATION 7 AIDS COLD WEATHER OPS

Formerly on stand-by status, Pump Station 7, located approximately 50 miles north of Fairbanks, has assumed an important role in cold weather operations. Not needed to pump oil under normal operating conditions, the ability to add heat to the pipe as it travels through Pump Station 7 is an important tool in moving oil through the Interior of Alaska during stretches of cold weather.

Pump Station 7 can add heat to the pipeline’s crude oil stream using an existing “legacy” pump. The mechanical energy provided by the pump converts to heat energy through pressure reducing valves. The recirculation system only operates when certain conditions, including temperature and throughput, increase the need for heat.

During recirculation, a portion of the crude stream passes through drag valves that produce a pressure drop to develop heat. That same crude oil then flows through a full head pump that adds more heat with friction and increases the pressure. The crude oil goes through yet another drag valve, dropping the pressure again and producing additional heat before the oil re-enters the pipeline.

“The main challenge we have encountered is the inclement weather, as most of the work occurs outdoors,” said Lori Howard, Pump Station

5 and 7 supervisor. “The project crew has done an outstanding job meeting the challenges to safely complete the work required to operate Pump Station 7 in a manual mode while the automation portion of the project is being finished.”





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“enhanced recirculation.” More friction means TAPS is running less efficiently, but what the pipeline loses in efficiency, it gains in heat.

“Keeping TAPS running safely and efficiently during the long Alaska winter requires incredible coordination and focus,” said Betsy Haines, Oil Movements Director. “Our team is up to the challenge, but getting more oil in the pipe is the best solution to many of the issues created by colder oil temperatures.”



OUR PEOPLE

DEBORAH HUGHES, OPERATIONS ENGINEER OPERATIONS CONTROL CENTER (OCC)

Deborah Hughes works in the Operations Control Center [OCC] in Anchorage as an Operations Engineer. She has worked for Alyeska for two years.

Does OCC have a role in cold weather operations? How?

Yes, OCC plays a critical role in cold weather operations. OCC is tasked with maintaining bulk crude oil temperature as warm as reasonably possible. The goal is to keep crude oil from reaching the freezing temperature of the entrained water that is present in oil. Operations engineering uses a thermal model to provide recommendations to the OCC controllers on how much heat should be added to the system at each location along TAPS. The controllers are able to adjust recycle rates to add the desired amount of heat.

What are some of the challenges to cold weather operations for OCC?

The main challenge of cold weather operations for OCC is that it is not always possible to recycle enough to add the desired amount of heat at each location. When a mainline pump or

turbine generator is offline, it directly affects the maximum recycle rates at a pump station, which in turn causes crude oil temperatures to drop. Other challenges include dealing with issues that are out of OCC’s control. Colder than usual ambient temperatures and pipeline throughput both have a huge effect on crude oil temperatures.

Looking ahead, do you see these challenges becoming more or less common? How?

I think the challenges related to cold weather operations and low flow will be increasing in the next few years. Each year as throughput decreases, the crude oil temperatures will be decreasing as well. In addition, scraper pigging operations are going to be more and more of a challenge as throughput declines.



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THE LINE

COLD OPERATIONS NEWSLETTER ▾

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