

**Alaska Legislature  
House and Senate  
Natural Resources Committees**

***Interior Oil and Gas Exploration***

***Part of “Middle Earth”***

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Juneau, Alaska**

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**DOYON**  
— Limited® —

# Overview

- Doyon exploration in Nenana and Yukon Flats
- Similarities and differences
- Focus on Nenana
  - Doyon 100% efforts over past 3 years include drilling and two seismic programs, including 3D in fall 2014
  - All elements of prolific hydrocarbon system present—source, traps and seals
    - Extensive column of wet gas in non-commercial 2013 well
- Importance of exploration credits program

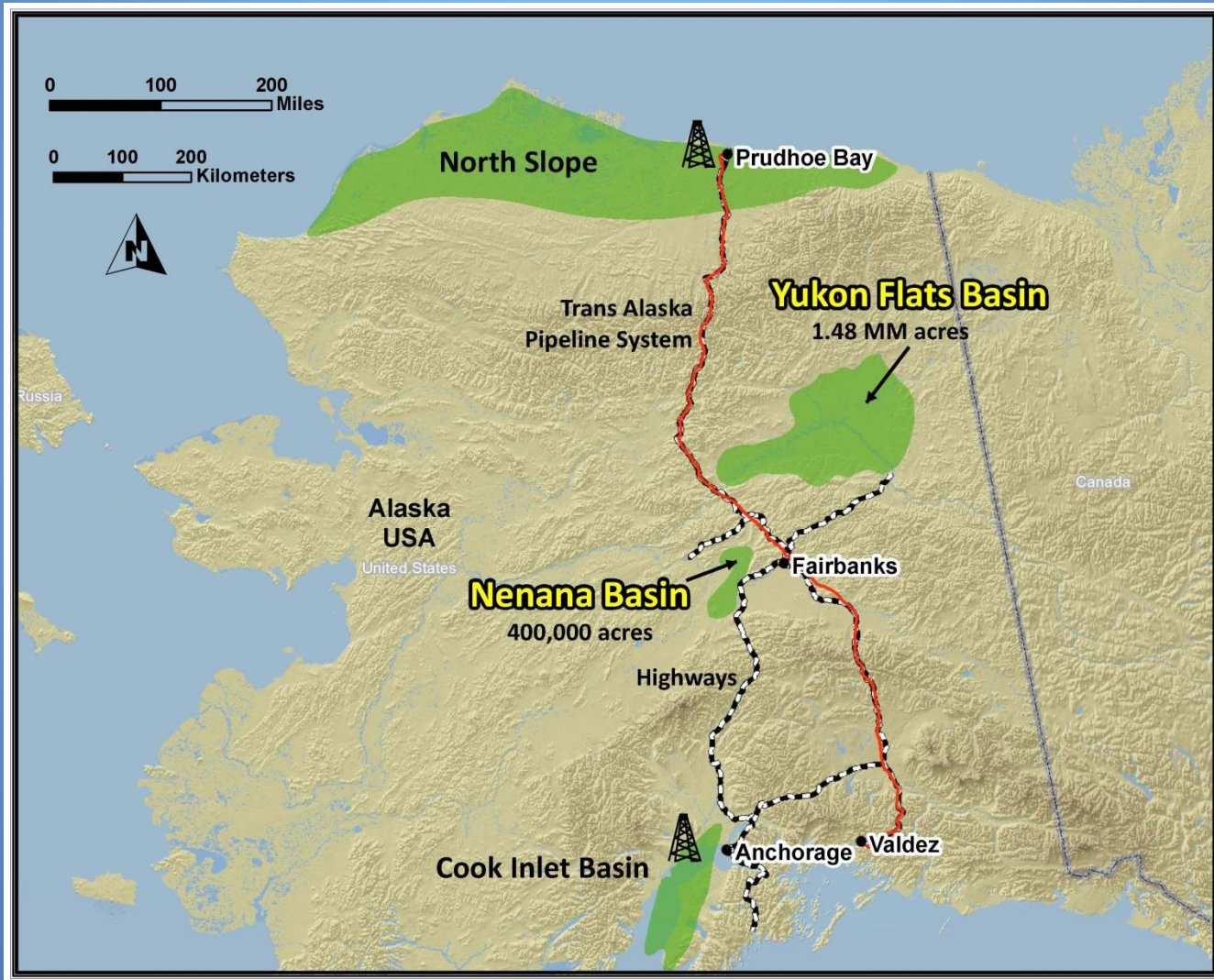
# Doyon, Limited

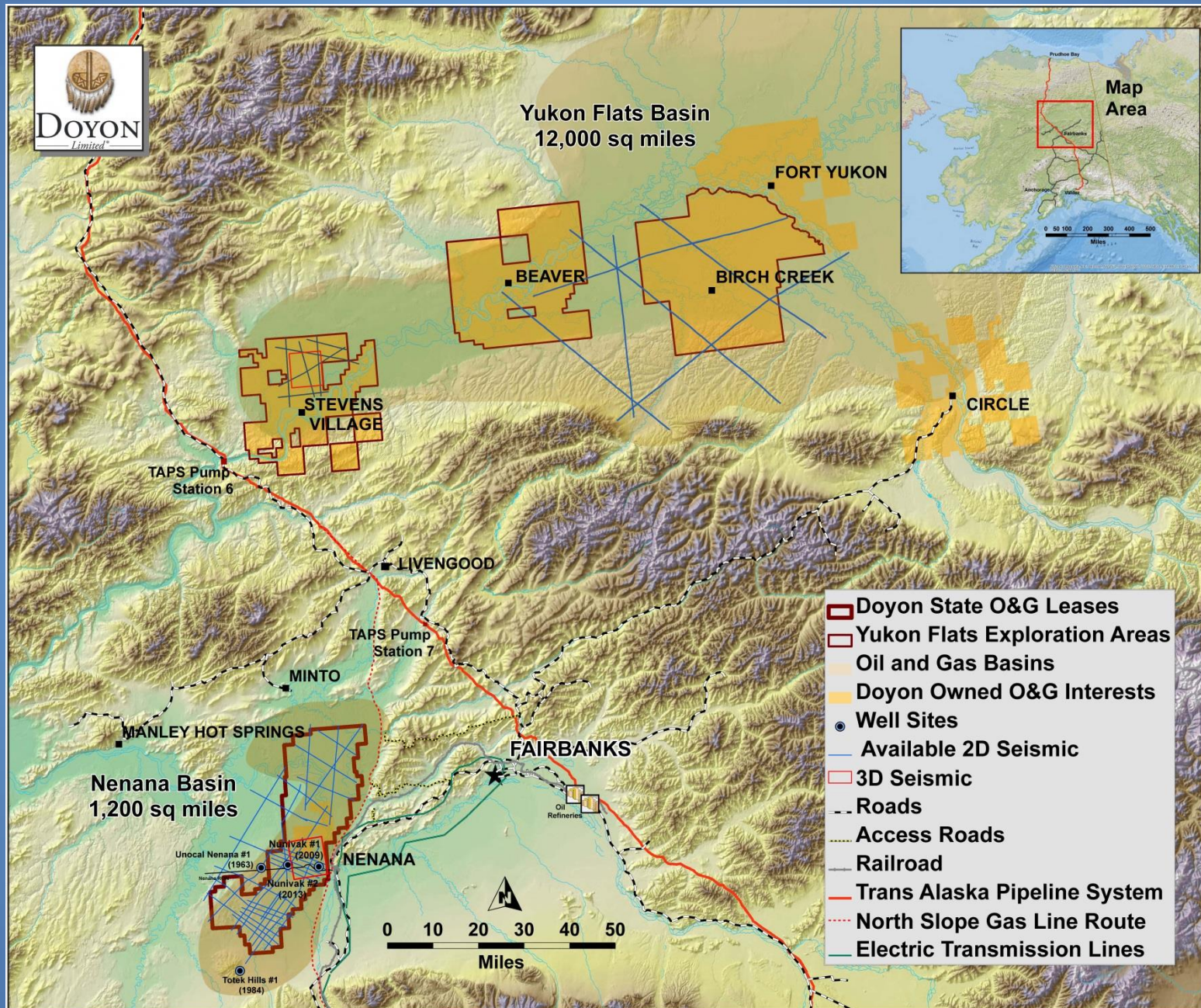
## Who are we?

- ANCSA regional corporation for Interior Alaska
- Alaska's largest private landowner
- 19,000 Native American shareholders
- Alaska operations focus
  - Several oil field services companies: Doyon Drilling, Doyon Universal, Doyon Associated, Doyon Anvil, Doyon Remote Facilities & Services
  - Interior oil, gas and hard minerals exploration
- 2014 after tax profits of \$23MM on revenues of \$363MM

# Interior Basins

## Where are they?





# Two Basins-Land Tenure

## Nenana/Minto

- 400,000 acres in 78 Doyon/State leases
  - 7 year primary term (year 2 now); yearly rentals of \$1.2 million
- 42,000 acres Doyon ANCSA lands--all Nenana ANCSA village surface
- No federal ownership nearby
  - northern third of leases in State refuge, O&G allowed conditionally

## Yukon Flats

- 1.4 million acres Doyon ANCSA lands in three separate sub-basins
  - No time constraints/holding costs
- Some surface ownership by 3 ANCSA villages--about half village, half Doyon
- Adjacent federal areas off-limits
  - federal wildlife refuge

# Two Basins-Similar Geology

## Common characteristics

- 20-25,000' non-marine Tertiary sedimentary section
- Abundant hydrogen-rich coals, coaly shales and *possibly* lake bed shales
- Traps

## CURRENT FOCUS ON NENANA BASIN

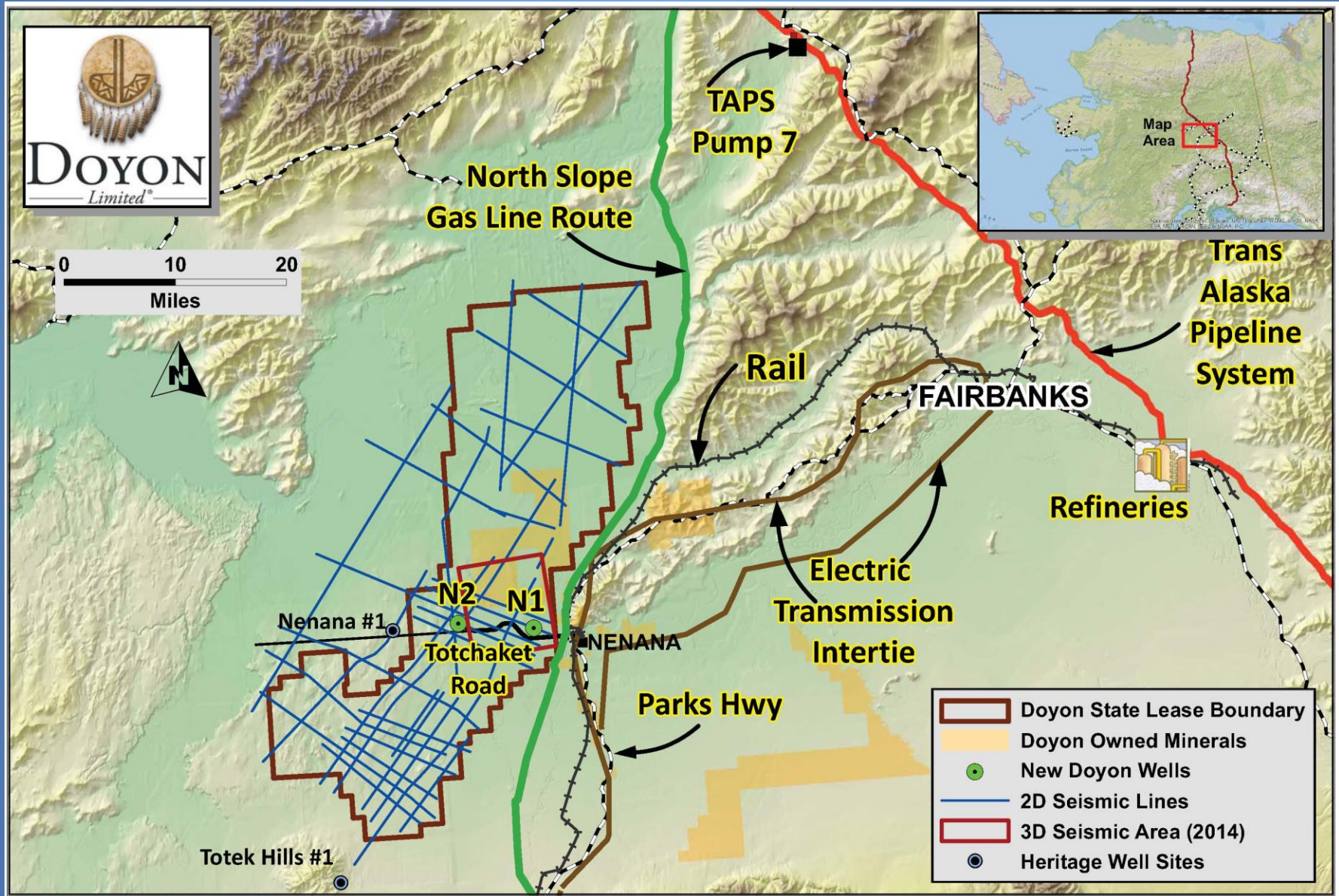
- Oil primary target, gas secondary

# Exploration Overview and History

## Nenana Basin

- **Prior exploration—1960s and 80s**
  - Seismic in central/south basin and two shallow wells on basin flanks--majors
- **Recent exploration campaigns—2005 to 2014**
  - Three seismic programs--basin wide (2005, 2012 and 2014)
  - Two central basin exploration wells (2009 and 2013)—Nunivak #1 and #2
- **Multiple other studies, including**
  - Surface geochemical surveys, airborne and ground gravity data
  - Re-evaluated licensed heritage data—Shell and ARCO Alaska
- **Doyon has accelerated the pace of exploration**
  - Three major programs since Doyon took over exploration in 2012—one well and 2 seismic programs, including 3D

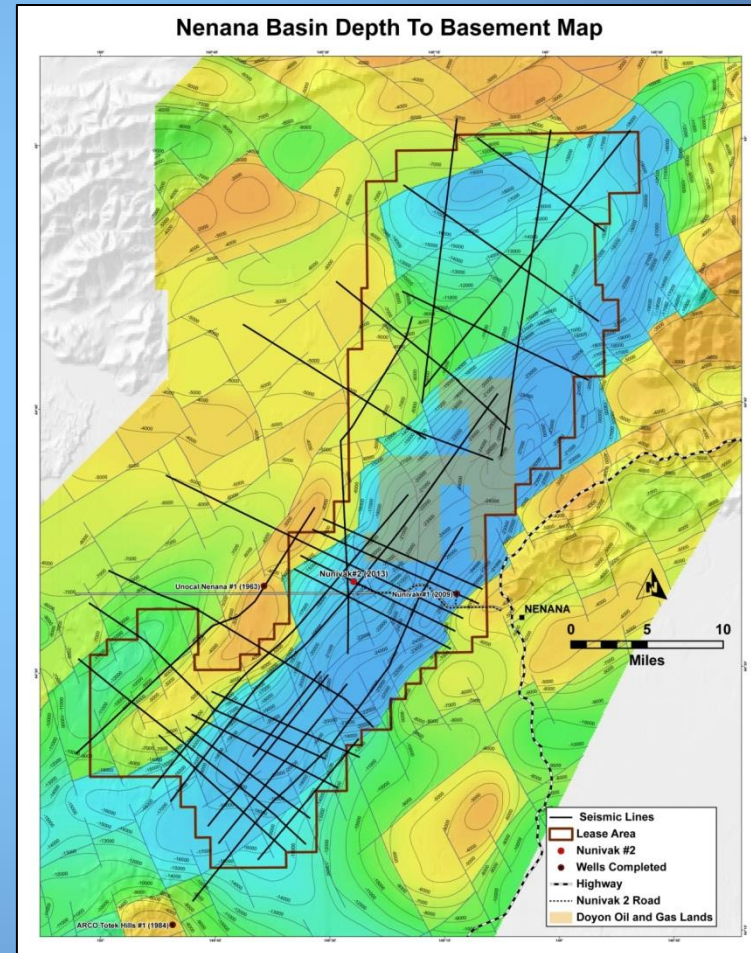
# Nenana Basin *Plus* Infrastructure



# Geophysics Define Nenana Basin

## (Gravity and Seismic)

- 20-25,000' sedimentary fill
- Narrow, broader at ends
- Over 50 miles long and up to 20 miles wide



# Nenana Petroleum System

- **Source**

- Excellent oil and wet gas source rocks in coals, coaly shales
  - From wells (immature), lake bed geochemistry of seeps, outcrop
  - Source rocks generate lots of oil in lab; analog basins
  - Deep lacustrine algal shales?
- Thermal maturity, down-dip thermal “kitchen”
  - From wells, seismic, other geophysics
  - Plenty of heat in basin to generate oil and gas from deeper source rocks
- Migrated wet gases (propane, butane et al.) at Nunivak #2, plus methane—indicative of an “oily” system

- **Seal/Reservoir**

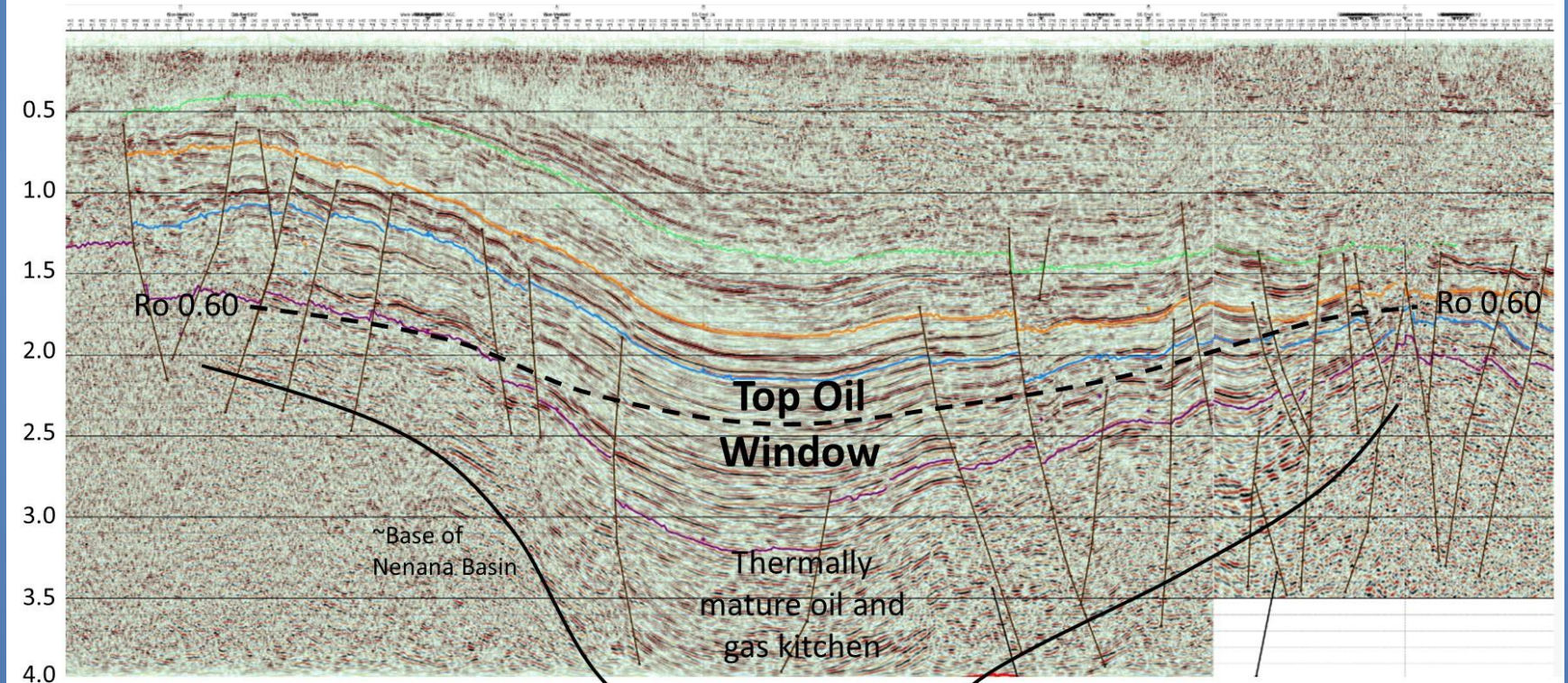
- Excellent, thick sandstones
  - 20-24% porosity; clean, quartz sand
- Attractive sand/shale ratio in target Healy Creek formation

- **Traps**

- Intra basin highs and fault blocks

# Oil and Gas “Kitchen”

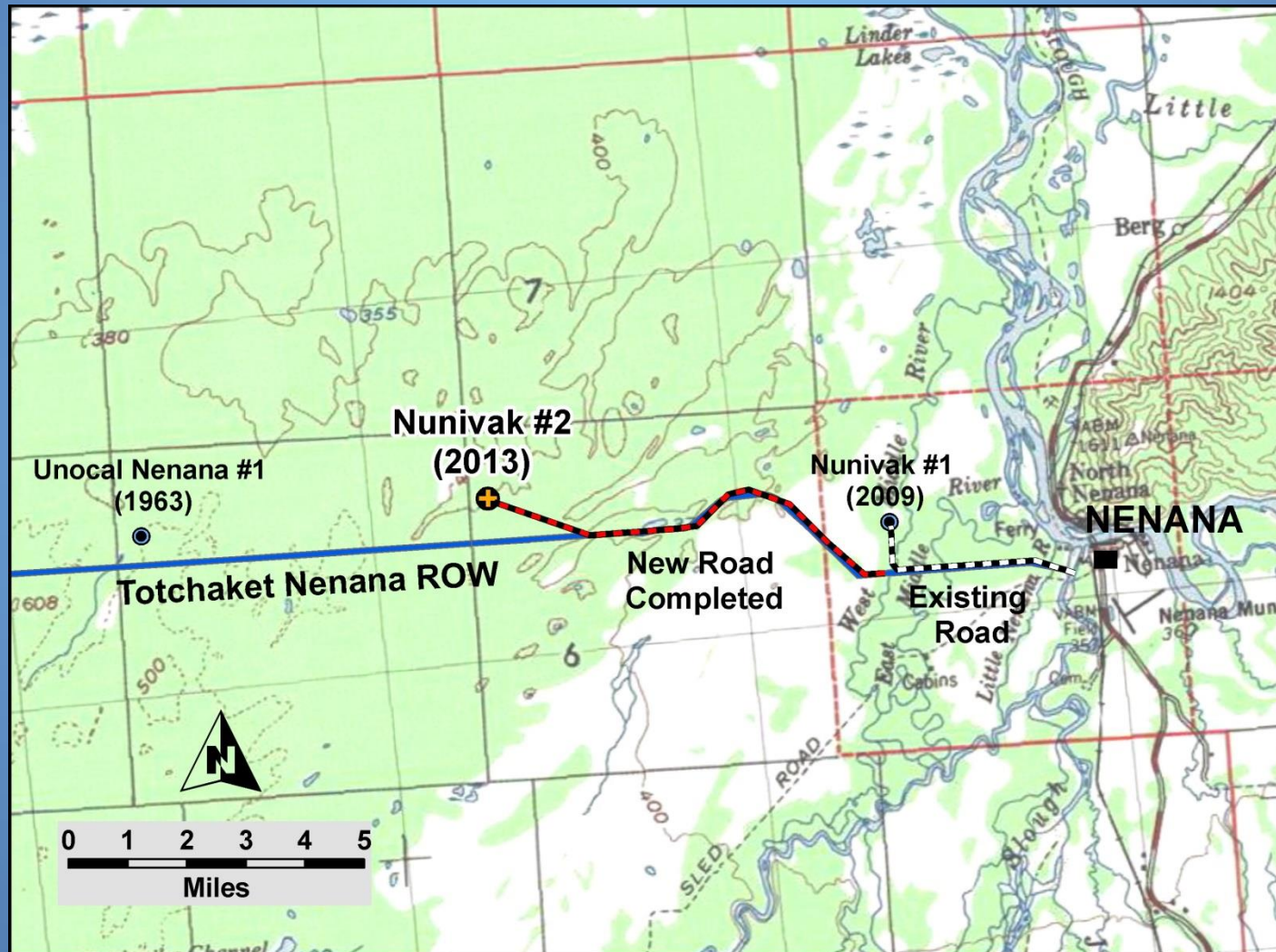
Composite basin strike line in southern Nenana Basin



# Nunivak #2 Well (N2)

- Began planning summer 2012
- First Doyon “operated” well
  - Totchaket Road extension--about 8 miles
    - Completed Winter 2013
- Drilled Summer 2013
  - 12 miles west of Nenana
  - 8 miles west of Nunivak #1
  - 1 vertical hole and a “sidetrack”
- Over 45 permits
  - State, federal, local
- Local city and tribal government consultation
- Meetings, newsletters, hotline, information officer
- Local hire and contracting

# N2 Wellsite and Road Extension



# N2 Nenana River Ferry

Bridge under construction now



# N2 Totchaket Road



# N2 Wellsite



# What Do We Think We Know Now?

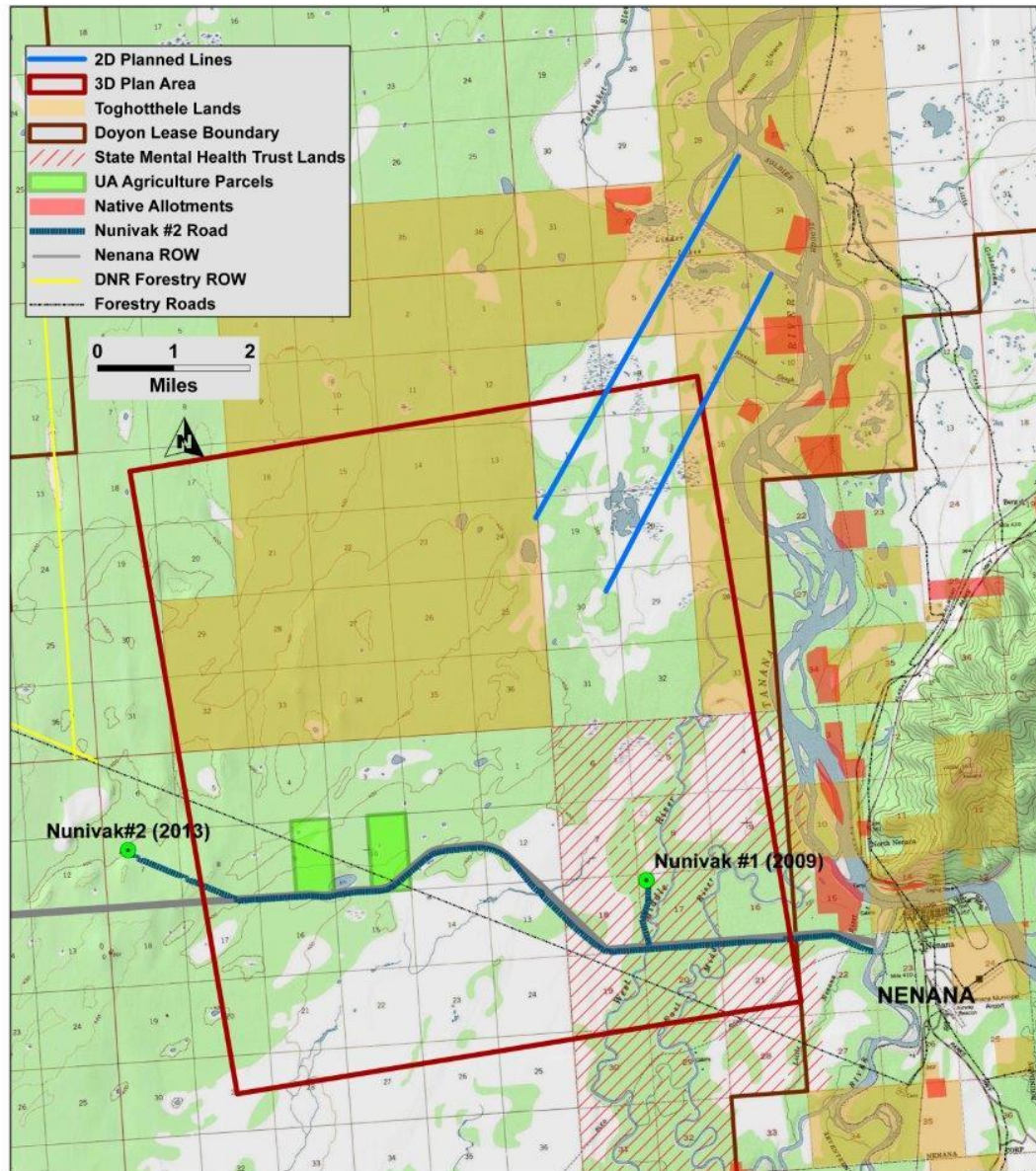
## Hydrocarbon Promise

- Through Nenana drilling we know we have all the elements of an active and prolific oil and wet gas/condensate system
  - Source, reservoir and seal
- Through Nenana seismic and other geophysical tools we know that the hydrocarbon system should be extensive
- Through modeling this basin should have produced billions of barrels of oil and trillions of cubic feet of gas
  - Lots of wet gas in N2 well bore, not so for oil
    - Gas promise substantially de-risked
  - How much gas and oil has been trapped and recoverable?
  - With location and nearby infrastructure, North Slope size accumulations not needed (though \$50 bbl oil not helpful)

# What's Next?

- **More seismic needed**
  - Multiple prospective areas we see from 2D seismic
  - Better define areas that may be worth drilling
- **Next up is area of promise between N1 and N2**
  - Goals: identify lower risk traps and develop new drill targets
  - 55 square miles of 3D seismic
  - Gathered in fall 2014
  - Processing and interpretation now
  - Multiple land owners—Doyon/Toghotthele, State, MHT and some UA
- **Drill in 3D area in winter or summer 2016?**
- **More seismic needed to develop drill targets from multiple “leads” in 2012 2D program**

# Nenana 2014 3D and 2D Seismic Area



# 2014 Nenana 3D



# How Define Success?

- **Oil discovery is best economic case for Doyon and State**
  - Start-up minimum economic field size is a modest (for Alaska) 25 million bbls to 50 million bbls, dependent on oil price
  - Plenty of room in nearby TAPS via truck, rail or feeder pipeline
  - Chance of success here with next well is perhaps 1 in 5 to 1 in 10
- **Gas only discovery is a head scratcher**
  - Could be stranded for a decade or more
  - Likely no Fairbanks market for many years due to Cook Inlet trucking and/or rail projects in motion
  - Will the producers and State allow Nenana gas into an export line and liquefaction plant, and if so under reasonable terms?
  - Yet gas has been so de-risked at Nenana that the next well has a 50/50 chance of commercial success

# **Special Thanks**

## **Alaska Legislature and State of Alaska**

State Exploration Credits Programs are essential to hydrocarbon exploration in Interior Alaska.

Middle Earth exploration would not have happened without State support.

# Questions and Comments

**For More Information:**  
**[www.doyonoil.com](http://www.doyonoil.com)**

