

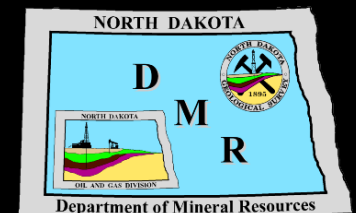
# *DEVELOPMENT OF THE BAKKEN RESOURCE*

*UND Law Students*

*Bismarck, ND – March 4, 2016*



School of Law

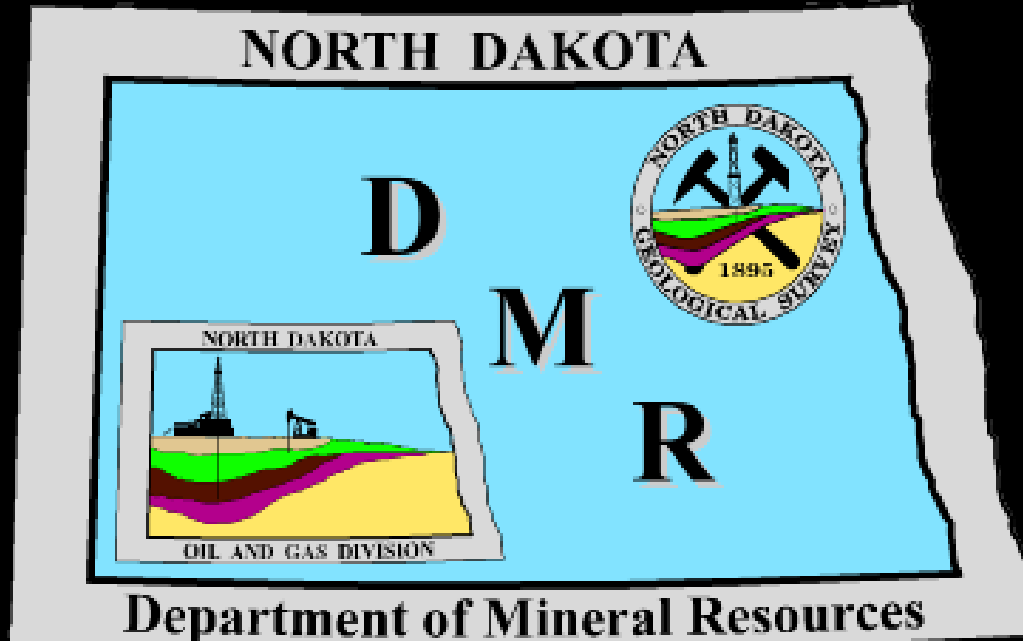


# **North Dakota Development**

- **Regulations**
- **Resource Play**
- **Development**
- **Hearing Procedure**
- **Bakken Results**

*Bruce E. Hicks*  
*Assistant Director*  
*NDIC-DMR-OGD*  
*Bismarck, ND*

# North Dakota Department of Mineral Resources



<https://www.dmr.nd.gov/oilgas/>

<https://www.dmr.nd.gov/ndgs/>

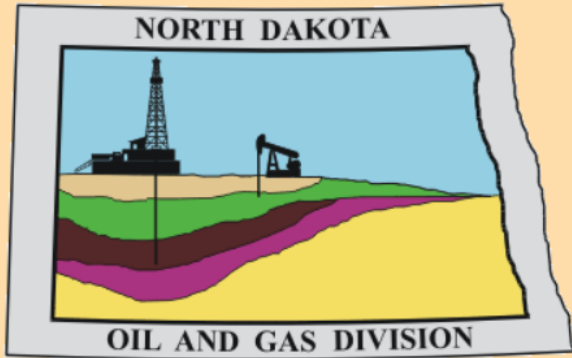
***600 East Boulevard Ave. - Dept 405***

***Bismarck, ND 58505-0840***

***(701) 328-8020***

***(701) 328-8000***

- Services
- Rules & Regulations
- Policies & Guidance
- Forms
- Hearing Dockets
- Active Drilling Rigs
- Daily Activity Reports
- Information Center
- Confidential Well List
- General Statistics
- Seismic
- Well Search
- Report a Spill/Incident
- Gathering Pipelines
- GIS Map Server
- Publications
- Surface Mineral Owner
- Basic Services
- Premium Services
- Electronic Filing
- Related Links
- FAQ & Web Help
- Employment Opportunities
- Contact Us
- Employee Directory
- Email Addresses



## Welcome to the North Dakota Industrial Commission, Department of Energy and Minerals, and Gas Division, Home page

Please check out the new [Information Center](#) and [Polling](#)

[Proposed Rule Changes and Adoption of New Rules](#)

[Rule Changes Full Notice](#)

[General Guidelines for Temporary Abandonment of Wells](#)

[Bakken and Three Forks Information!](#)

Available on the ND Petroleum Council web site are the [Surface Owner Information Center](#), the [Royalty Owner Information Center](#)

The Oil and Gas Division regulates the drilling and production of oil and gas in North Dakota. Our mission is to encourage and promote the development, production, and utilization of oil and gas in the state in such a manner as will prevent waste, maximize economic recovery, and fully protect the correlative rights of all owners to the end that the landowners, the royalty owners, the producers, and the general public realize the greatest possible good from these vital natural resources.

**Phone:** (701) 328-8020  
**Fax:** (701) 328-8022  
**Mail:**  
NDIC Oil and Gas Division  
600 East Boulevard Ave  
Bismarck, ND 58505-0848  
**General Shipping:**  
NDIC Oil and Gas Division





Related Links

- Active Drilling Rigs
- Daily Activity Reports
- Confidential Well List

## Information Center

The Director's Cut is an update on current activity in the North Dakota oil patch from the Director of the Department of Mineral Resources.

[Tentative Director's Cut Dates](#)

[Director's Cut - 02/17/2016](#)

[Director's Cut Archive](#)

[Director's Cut Webinars](#)

[Recent Presentations](#)

View [press releases](#) from the Oil and Gas Division

### Oil and Gas Division Program Descriptions:

This section of the Information Center is dedicated to program descriptions within the Oil and Gas Division. We will be adding descriptions as they become available, so check back for further information.

[Underground Injection Control Program](#)

# North Dakota Development

- **Regulations**
  - Spacing
  - Pooling
  - Unitization
- Resource Play
- Development
- Hearing Procedure
- Bakken Results

# Spacing

## Drilling Units

- **NDAC Sec 43-02-03-18**
  - **One hor well per Section (640 acres)**
  - **Exception—notice & hearing**

## Spacing Units

- **Comm order after notice & hearing**
  - **Multiple hor wells per SU (2-30+)**
  - **320,640,960,1280,1920,2640,3200,5280**

# North Dakota Development

- **Regulations**
  - Spacing
  - **Pooling**
  - Unitization
- Resource Play
- Development
- Hearing Procedure
- Bakken Results

# Pooling

## **NDCC Sec 38-08-08**

- **Two or more separately owned tracts**
- **No voluntary pooling**
- **NDIC “shall” force pool all interests**

# North Dakota Development

- **Regulations**
  - Spacing
  - Pooling
  - **Unitization**
- Resource Play
- Development
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- Bakken Results

# Unitization

## **NDCC Sec 38-08-09.3**

- **Project to substantially increase recovery**
- **EOR unnecessary for approval**

## **NDCC Sec 38-08-09.5**

- **60% MIO approval**
- **60% WIO approval**
- **Corral Creek-Bakken Unit—eff 1-1-2012**
- **Grail-Bakken Unit**
  - **Heard in Grand Forks 11-13-2013**
  - **Passed IC 2-1, failed to achieve 60% MIO**

# North Dakota Development

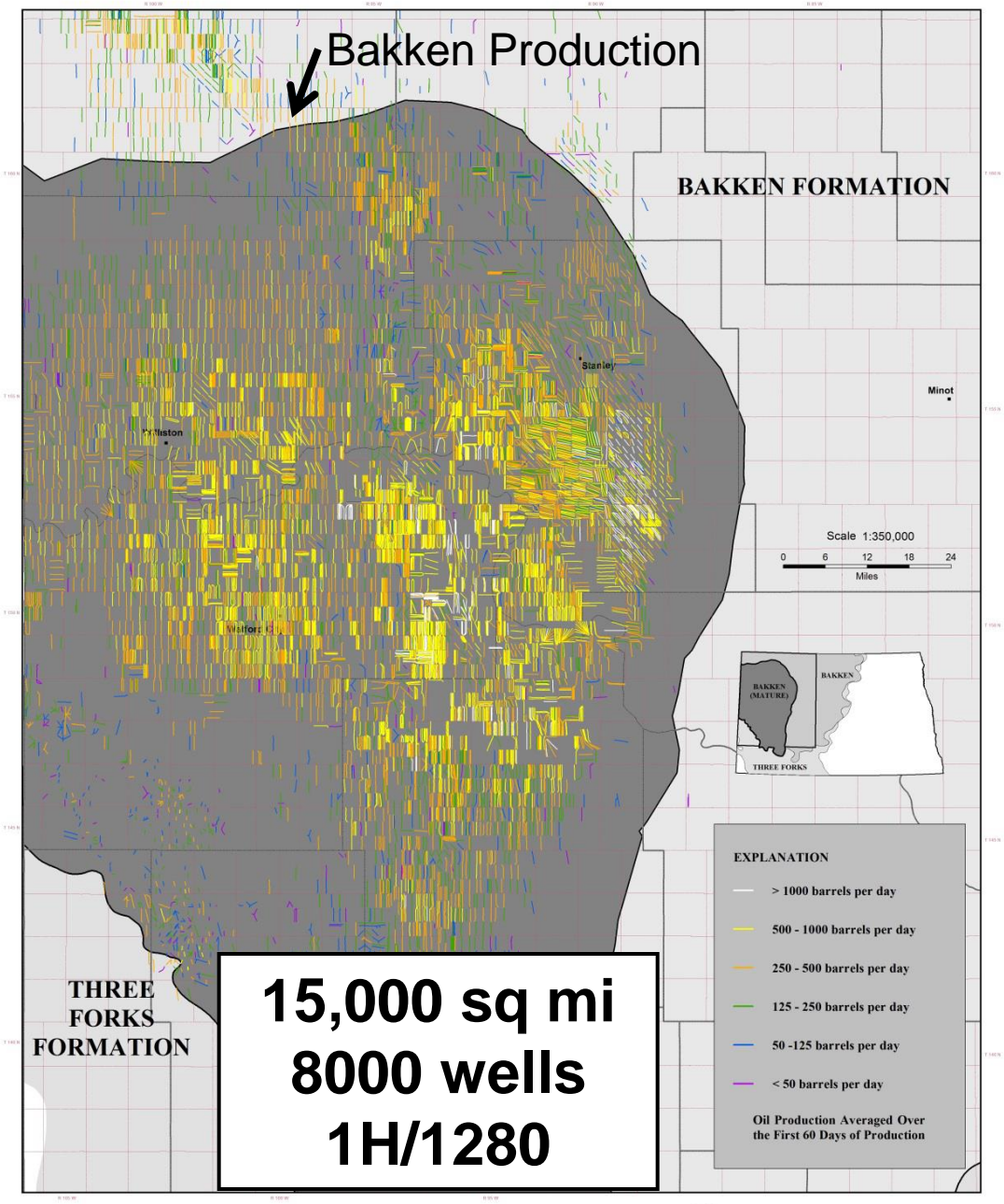
- Regulations
  - Spacing units
  - Pooling
  - Unitization
- **Resource Play**
- Development
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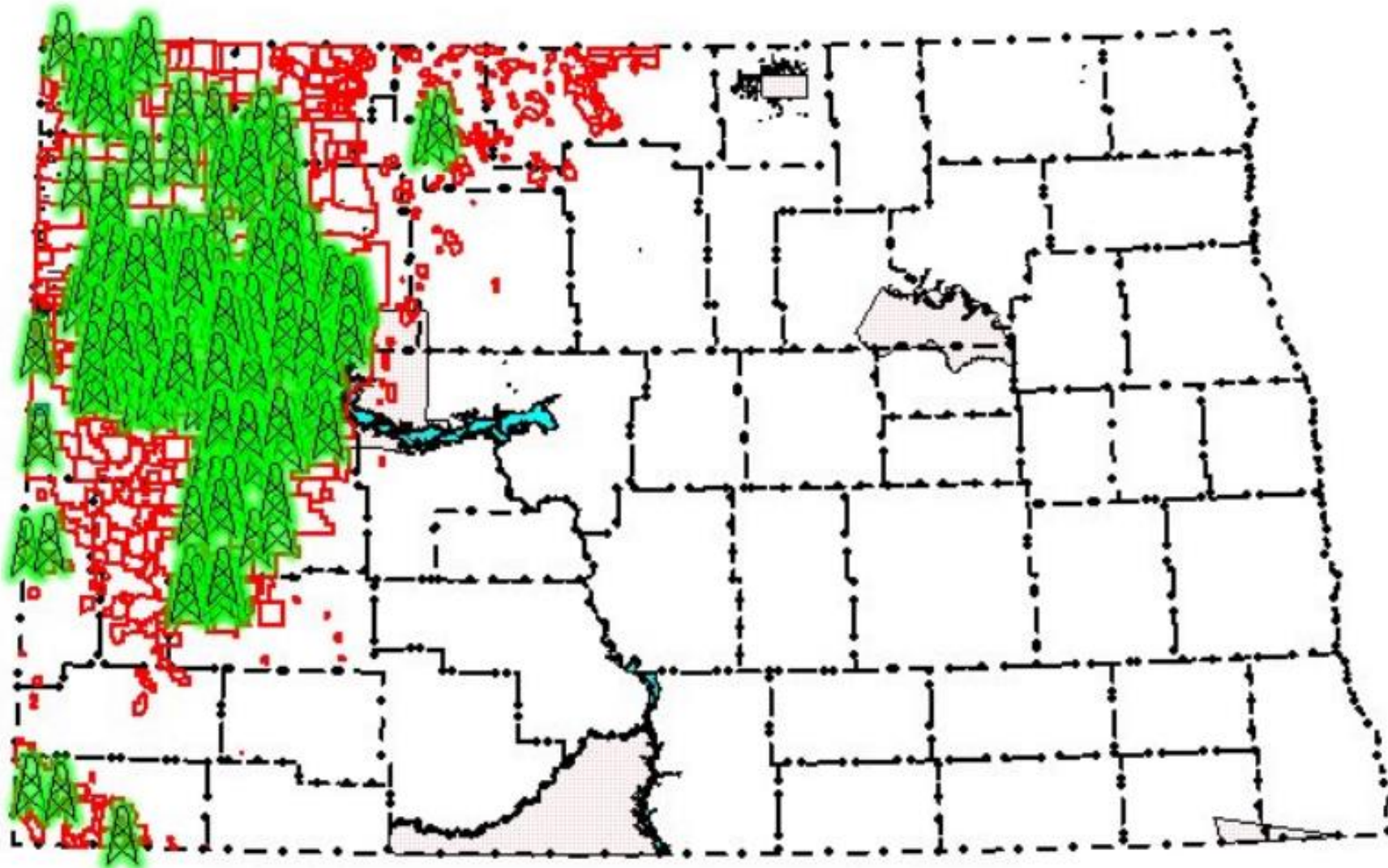


# First 60 Day Average Bakken Horizontal Production by Well

July 2015



# NORTH DAKOTA – 191 DRILLING RIGS – DECEMBER 2014



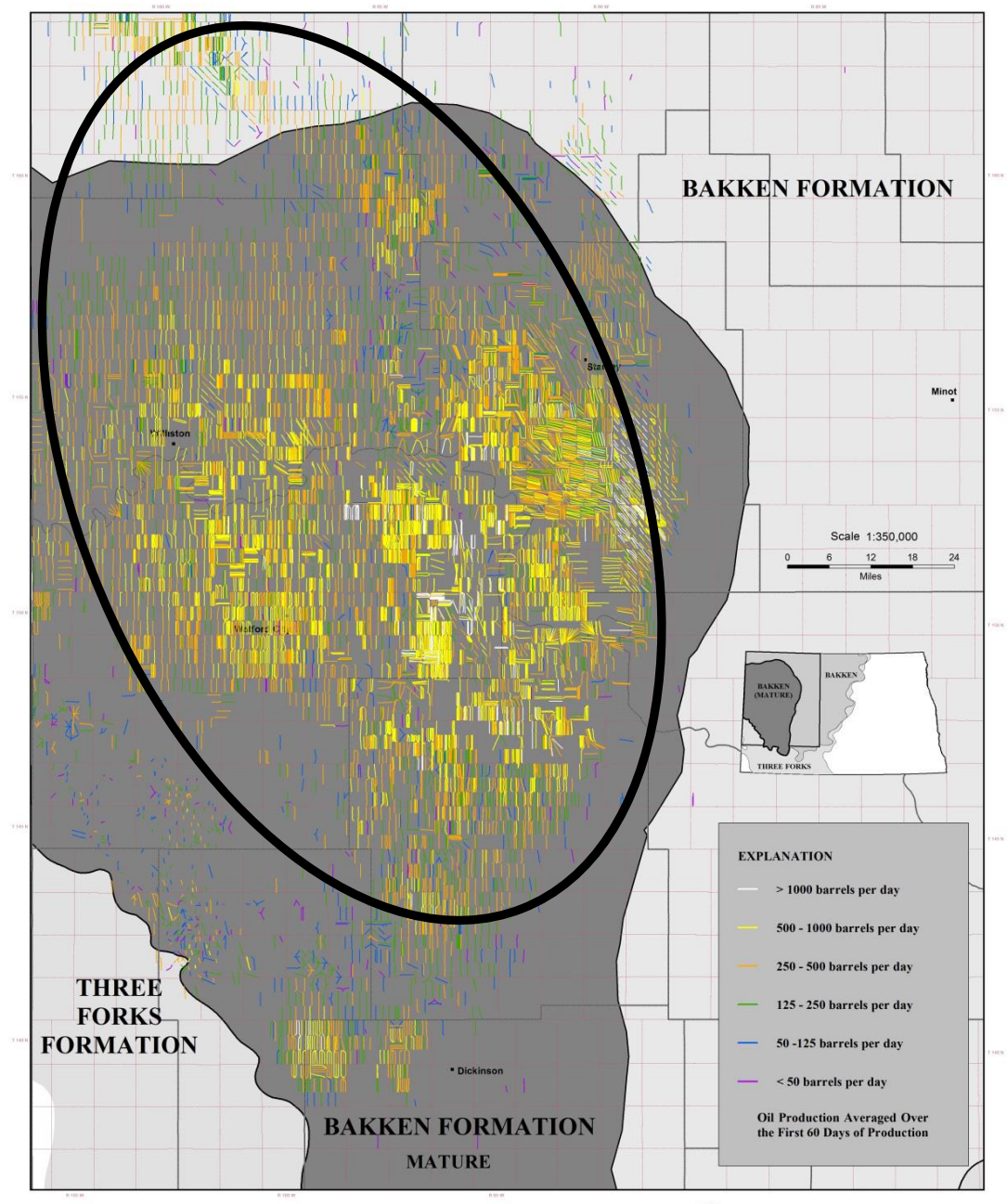
**Current drilling activity is focused  
in Mountrail, Dunn, McKenzie, and Williams Counties.**



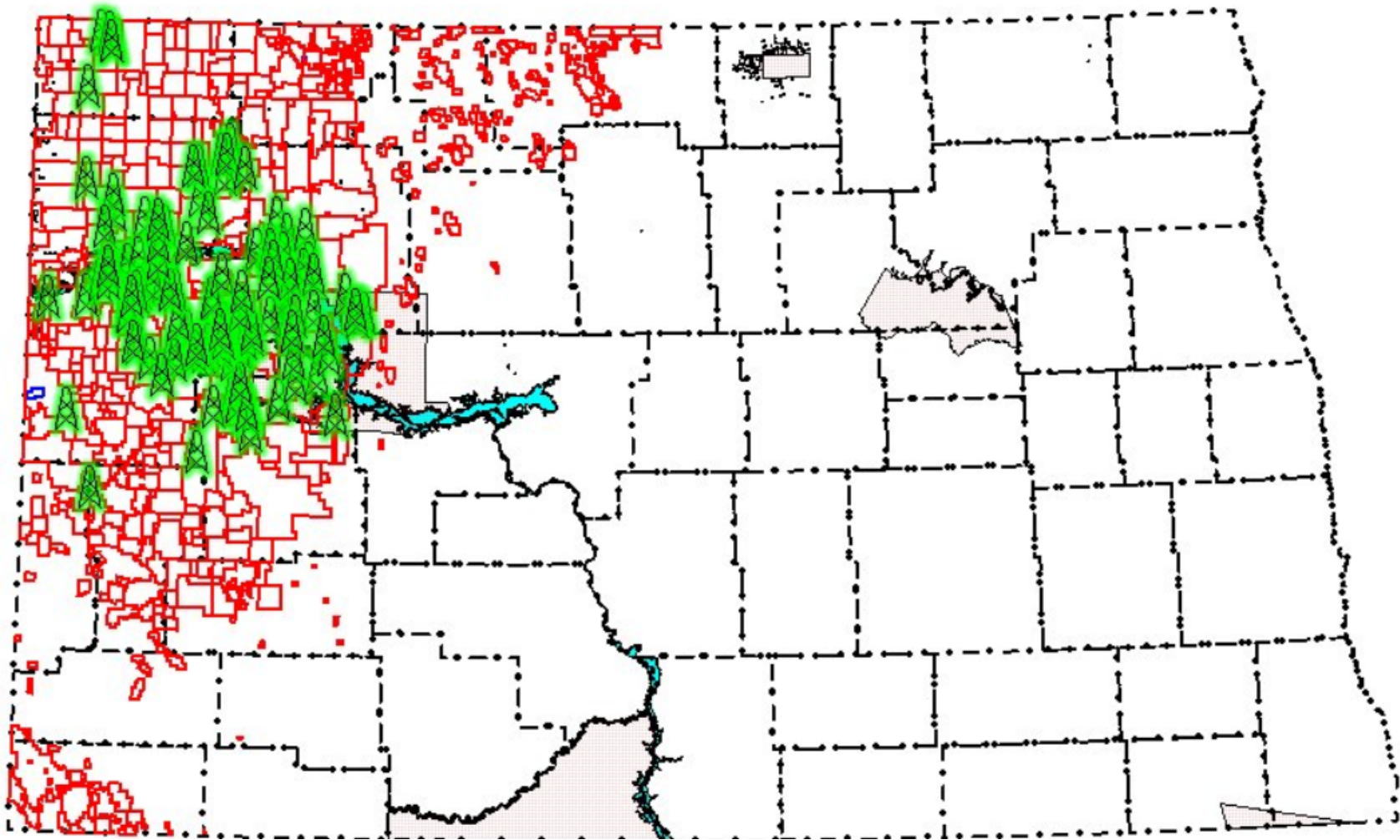


# First 60 Day Average Bakken Horizontal Production by Well

July 2015



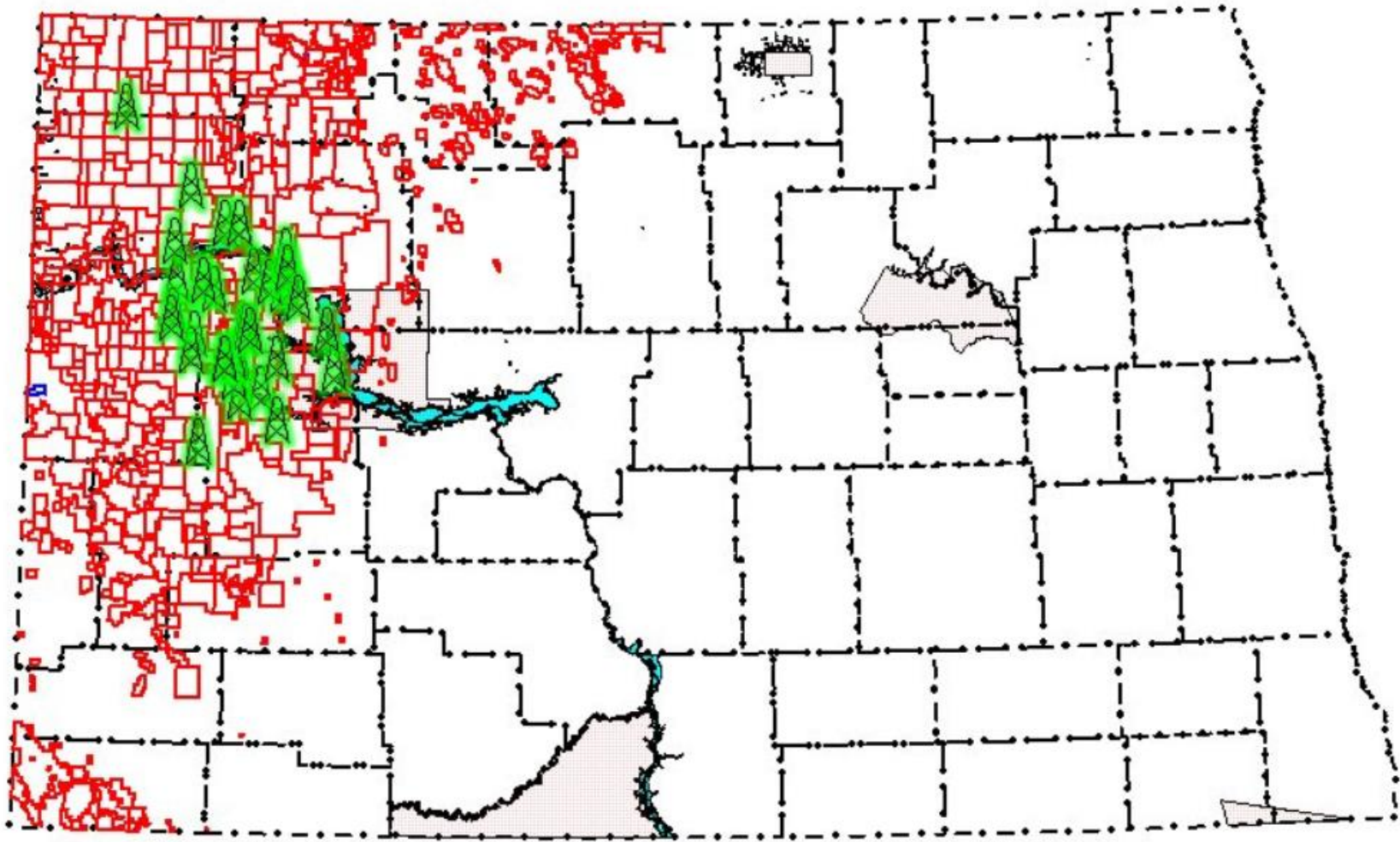
# NORTH DAKOTA – 113 DRILLING RIGS – MARCH 2015



**Current drilling activity is focused  
in Mountrail, Dunn, McKenzie, and Williams Counties.**



# **NORTH DAKOTA – 35 DRILLING RIGS – MARCH 2016**



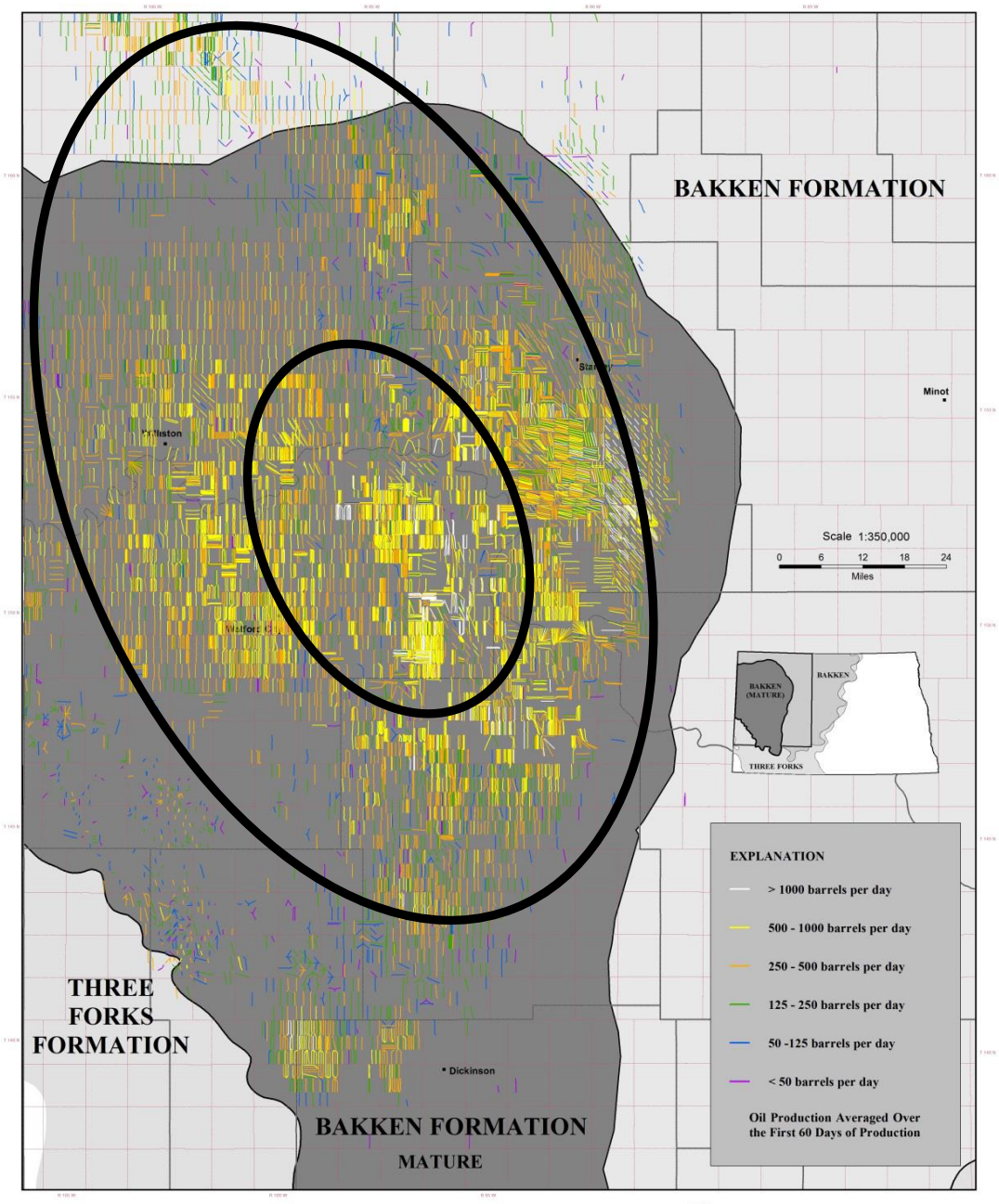
**Current drilling activity is focused**

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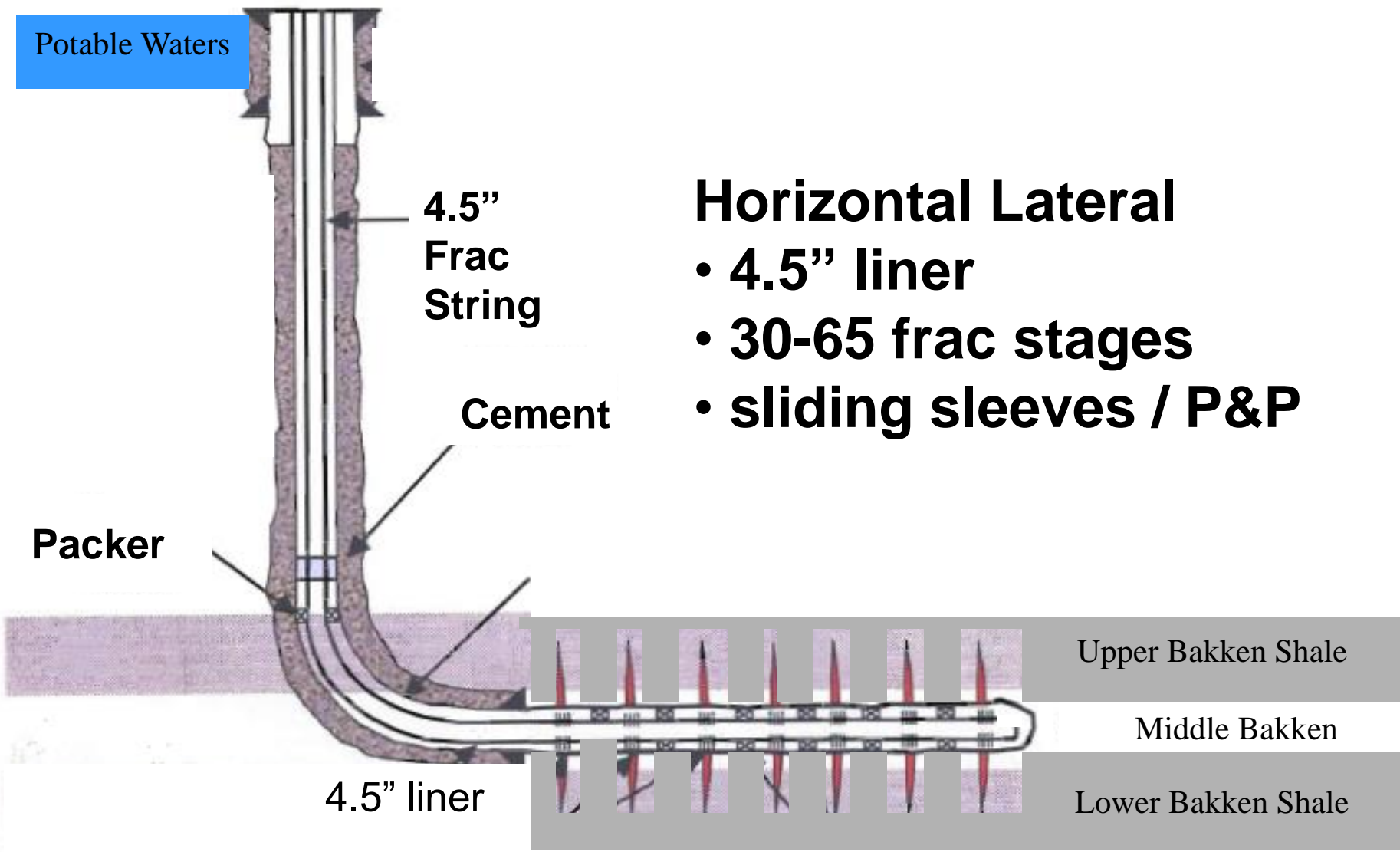


# First 60 Day Average Bakken Horizontal Production by Well

July 2015



# TYPICAL HORIZONTAL OIL WELL



Potable Waters

4.5"  
Frac  
String

Cement

Packer

4.5" liner

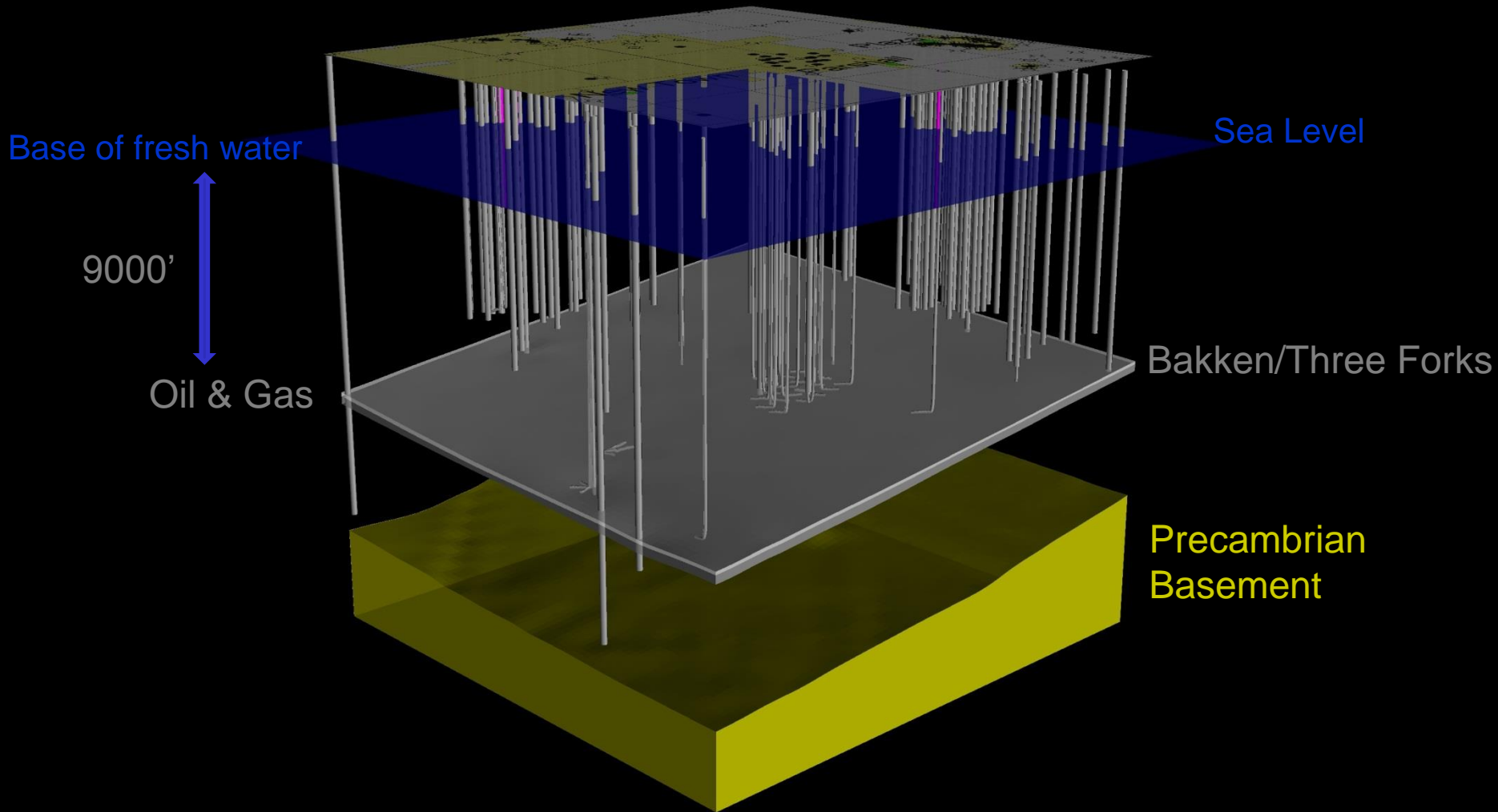
## Horizontal Lateral

- 4.5" liner
- 30-65 frac stages
- sliding sleeves / P&P

Upper Bakken Shale

Middle Bakken

Lower Bakken Shale

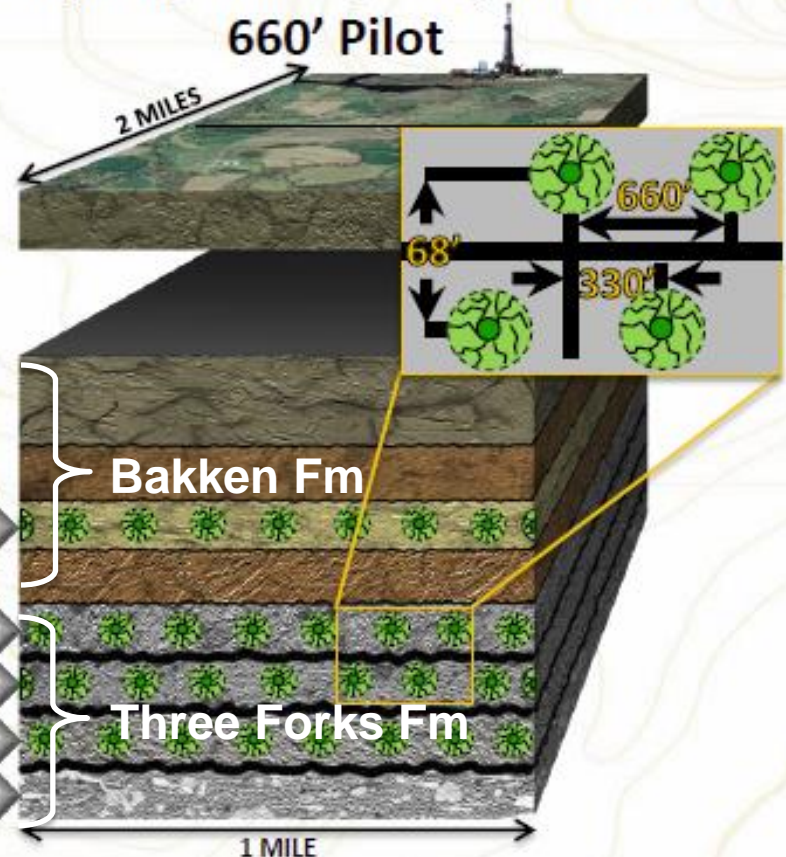
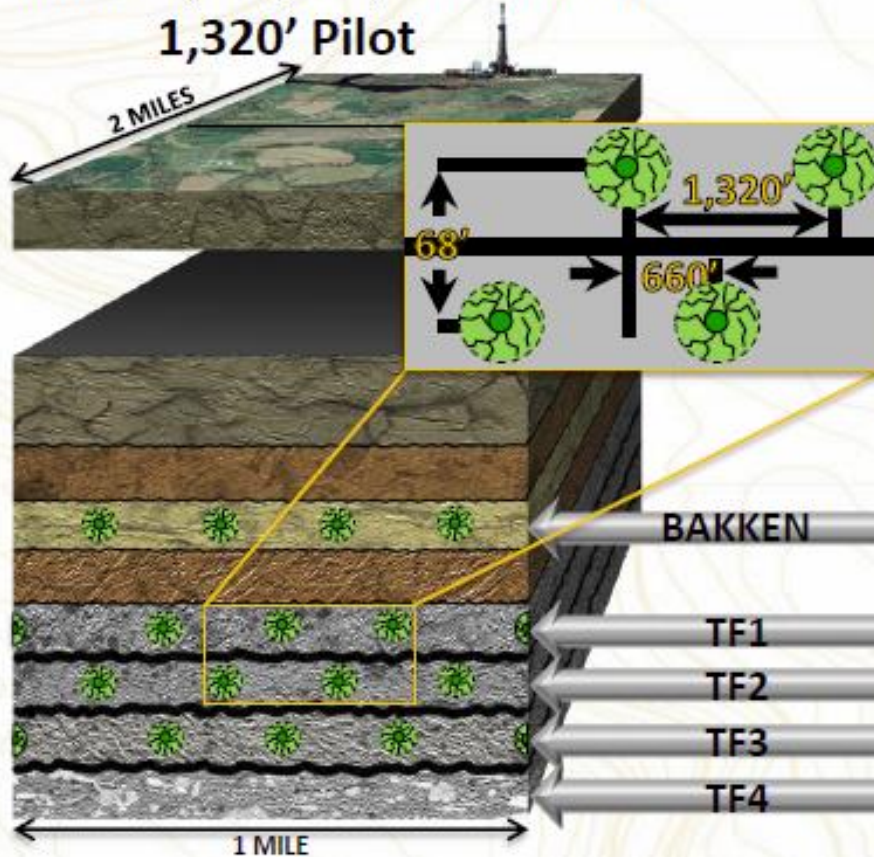




# 1,320' & 660' Pilot Density Projects: 2013-14

*Hawkinson, Tangsrud, and Rollefstad*

*Wahpeton, Lawrence, Mack, and Hartman*



- 3 project areas
- 1,320 ft. same-zone spacing
- 34 new wells (gross)

- 4 project areas
- 660 ft. same-zone spacing
- 31 new wells (gross)

# North Dakota Development

- Regulations
- Resource Play
- **Development**
  - **Uniform Spacing—orderly development**
  - Multi-well locations—small footprint
  - Energy Corridors—industry & residents
- Hearing Procedure
- Bakken Results



# ArcIMS Viewer



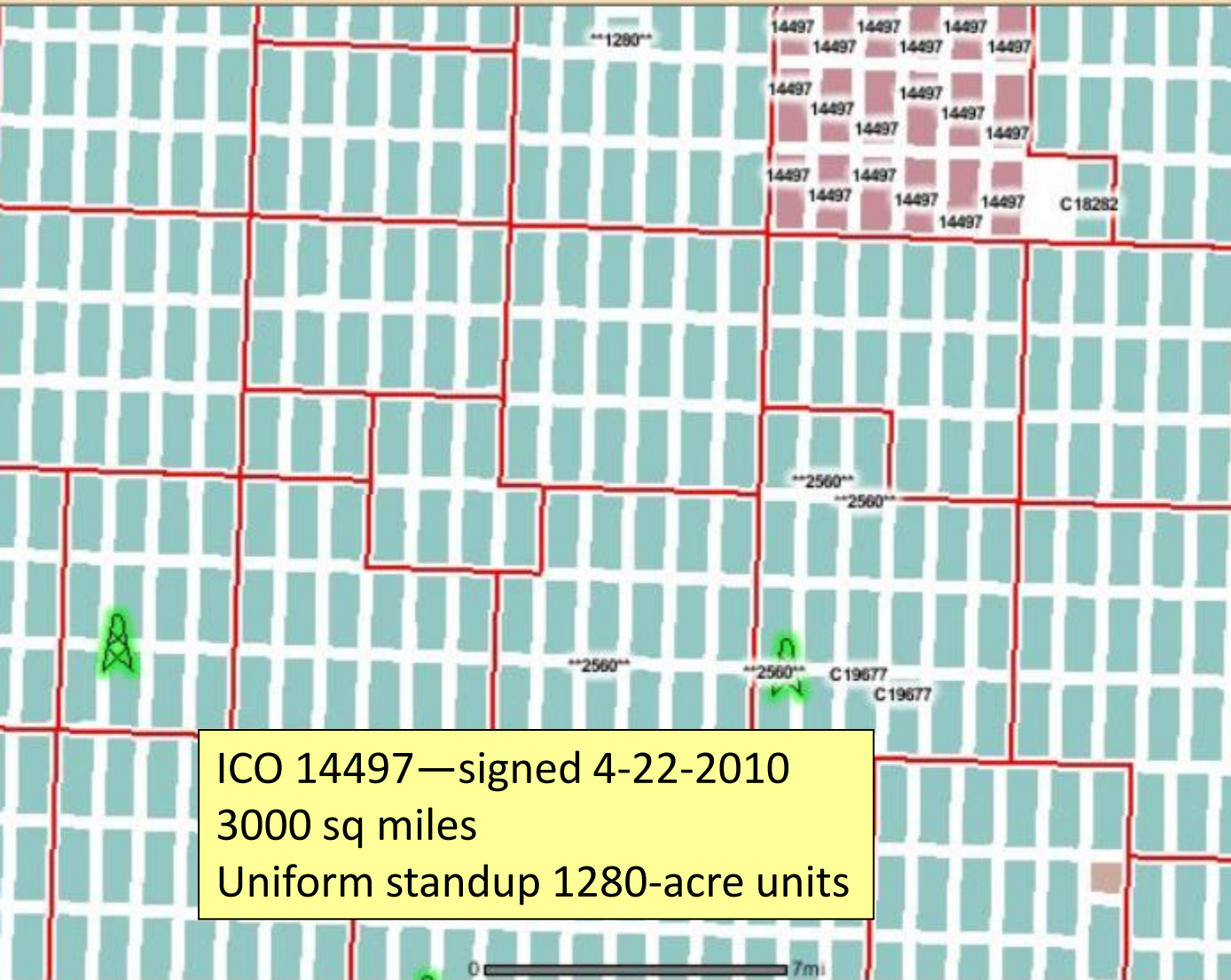
Five Spacing Patterns

Townships

Rec	Township	Tdir	Range	Rdir	TWPRNG	TWPTEXT	RNGTEXT
1	156	N	90	W	156090	T156N	R 90W

ND OIL

- Oil and Gas
- Well
- Per
- Rig
- Dir
- Dir
- Ho
- Ho
- Ca
- Oil
- Un
- Ins
- Dri
- Se
- Ga
- Other
- Re
- Co
- Riv
- Lar
- Imagery
- Topo
- Topo
- NAIP



**ND OIL & GAS LAYERS**

- Oil and Gas
  - Wells
  - Permit Status Before Spud
  - Rig Location
  - Directional Surveys
  - Directional Legs
  - Horizontal Surveys
  - Horizontal Legs
  - Cases Docketed
  - Oil Fields
  - Unit Boundaries
  - Inspector Areas
  - Drilling / Spacing
  - Seismic
  - Gas Plants
- Other
- Imagery
  - Topo/DRG 250k
  - Topo/DRG 100k
  - NAIP 2009

**Refresh Map**

Auto Refresh

Help:

- A closed group, click to open.
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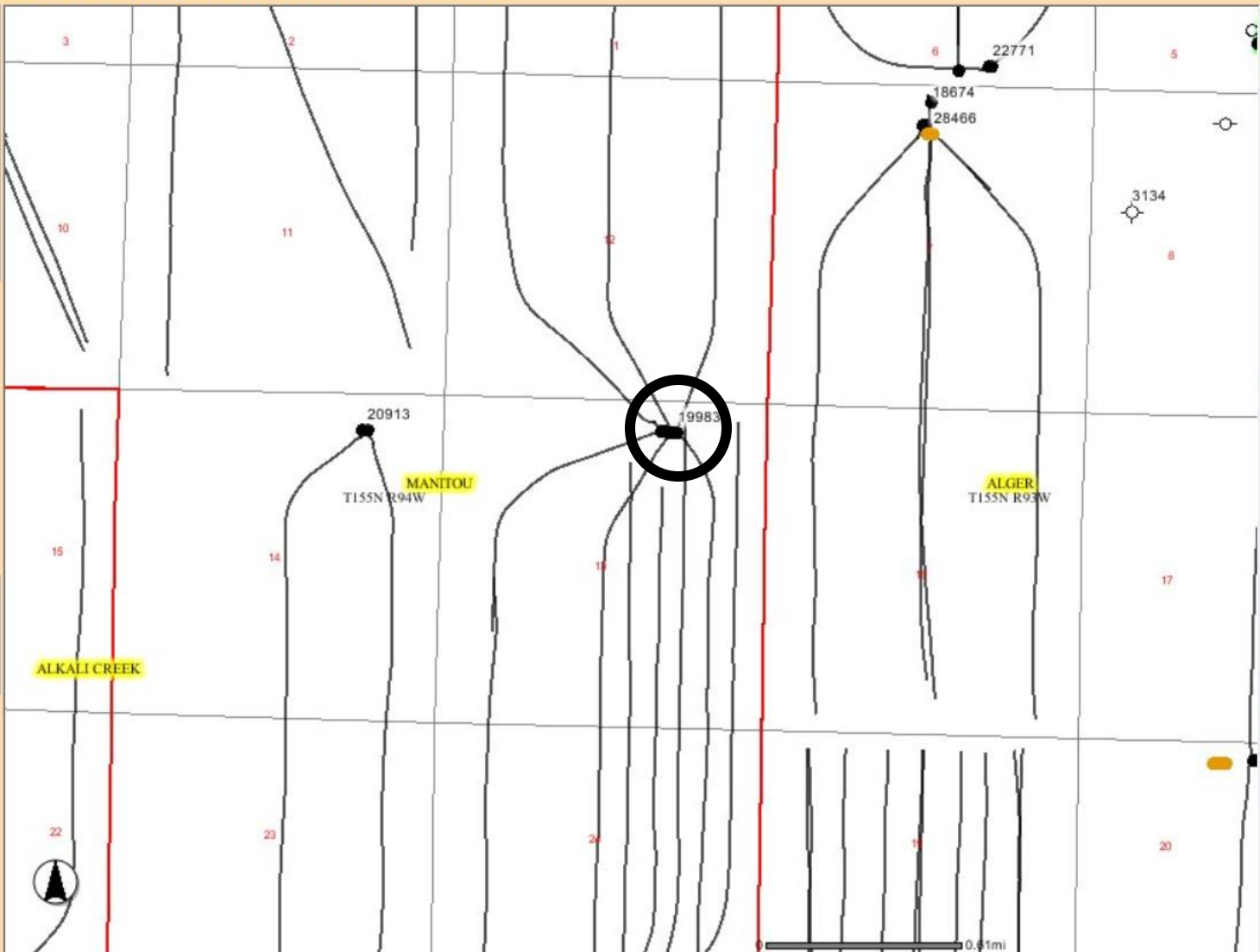
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# Oil and Gas Subscription: ArcIMS Viewer

- Legend / Layers
- Overview Map
- View Entire State
- Previous View
- Clear Selection
- Search
- Create PDF
- Zoom In
- Zoom Out
- Pan
- Rect Identify
- Select Object
- Buffer
- Distance
- Find Well
- Find Field / Unit
- Find Section



**Wells**  
Selection cleared.

- ND OIL & GAS**
- Oil and Gas
    - Wells
      - Permit S
      - Rig Loca
      - Direction
      - Direction
      - Horizont
      - Horizont
      - Cases D
      - Oil Fields
      - Unit Bou
      - Inspecto
    - Drilling /
    - Seismic
    - Gas Plan
  - Other
    - Railroads
    - Reservat
    - Corporat
    - Town
    - Section
    - Count
    - City E
    - Rivers an
    - Land Ow
    - FortB
    - FortB
    - Surfa
    - BLM
    - US F
  - Imagery
    - Topo/DRG
    - Topo/DRG
    - NAIP 2014

**Refresh**

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Help

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- A hidden group/layer, c
- A visible group/layer, d





Vern Whitten Photography

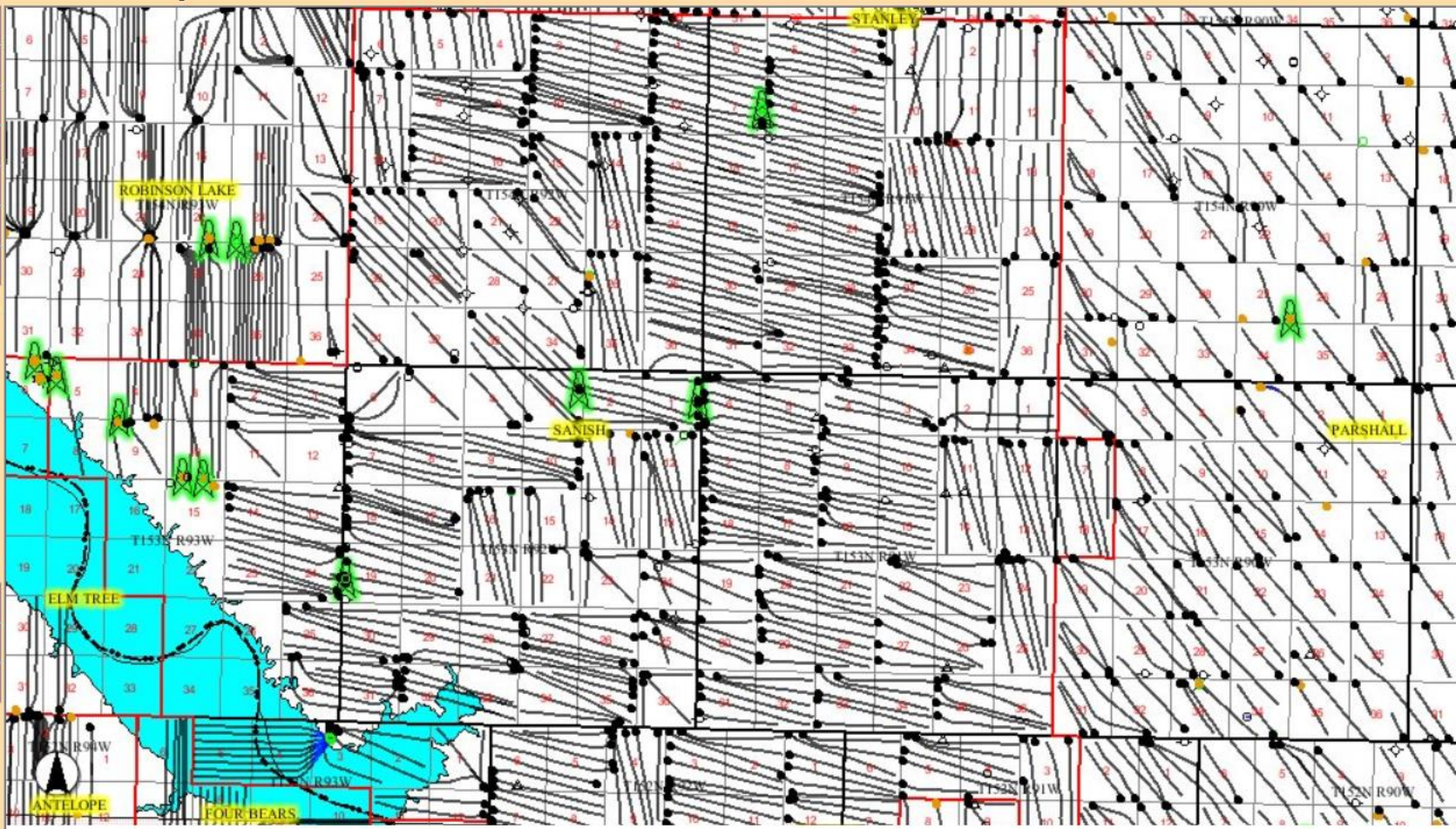
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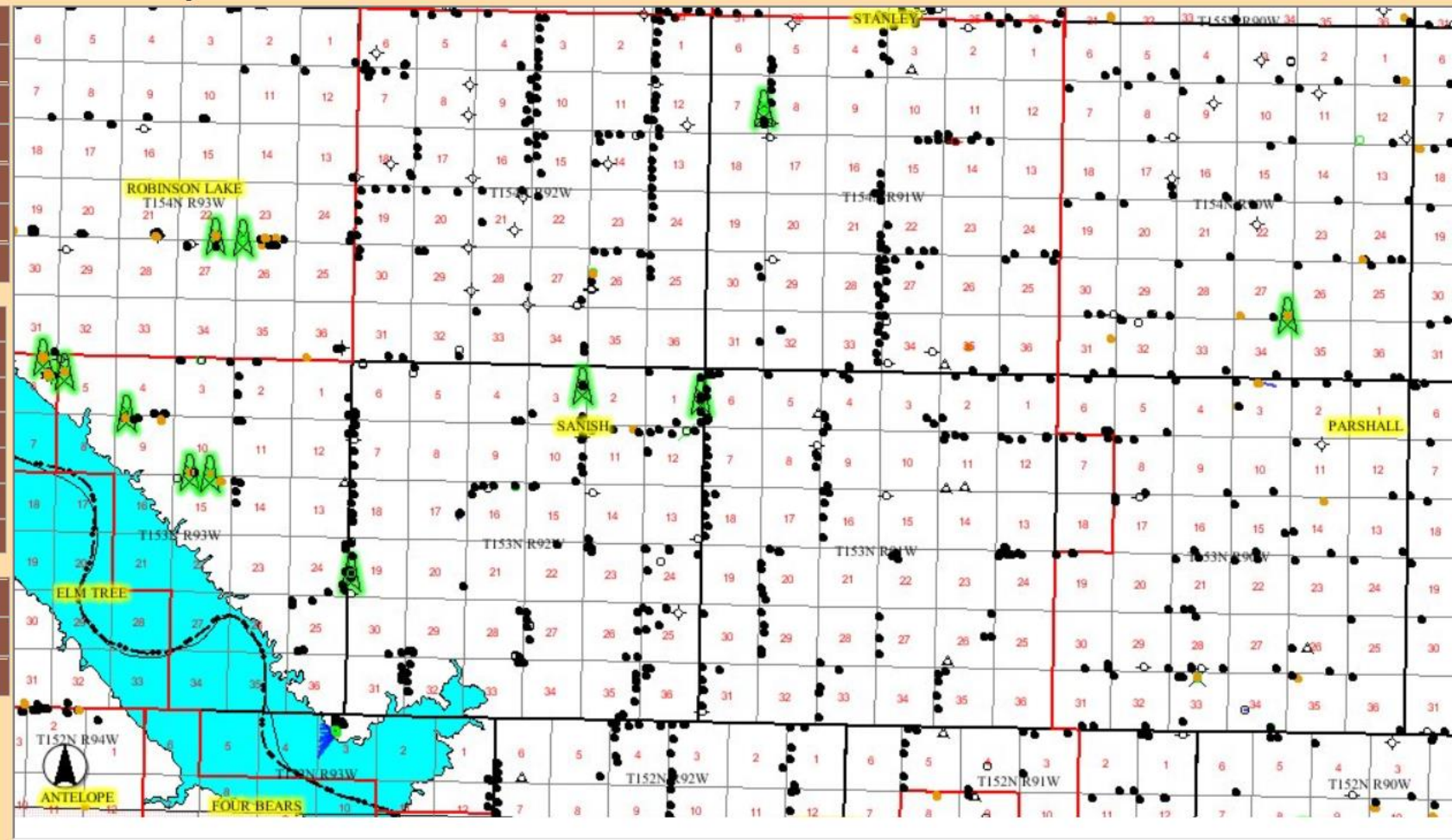


Pan



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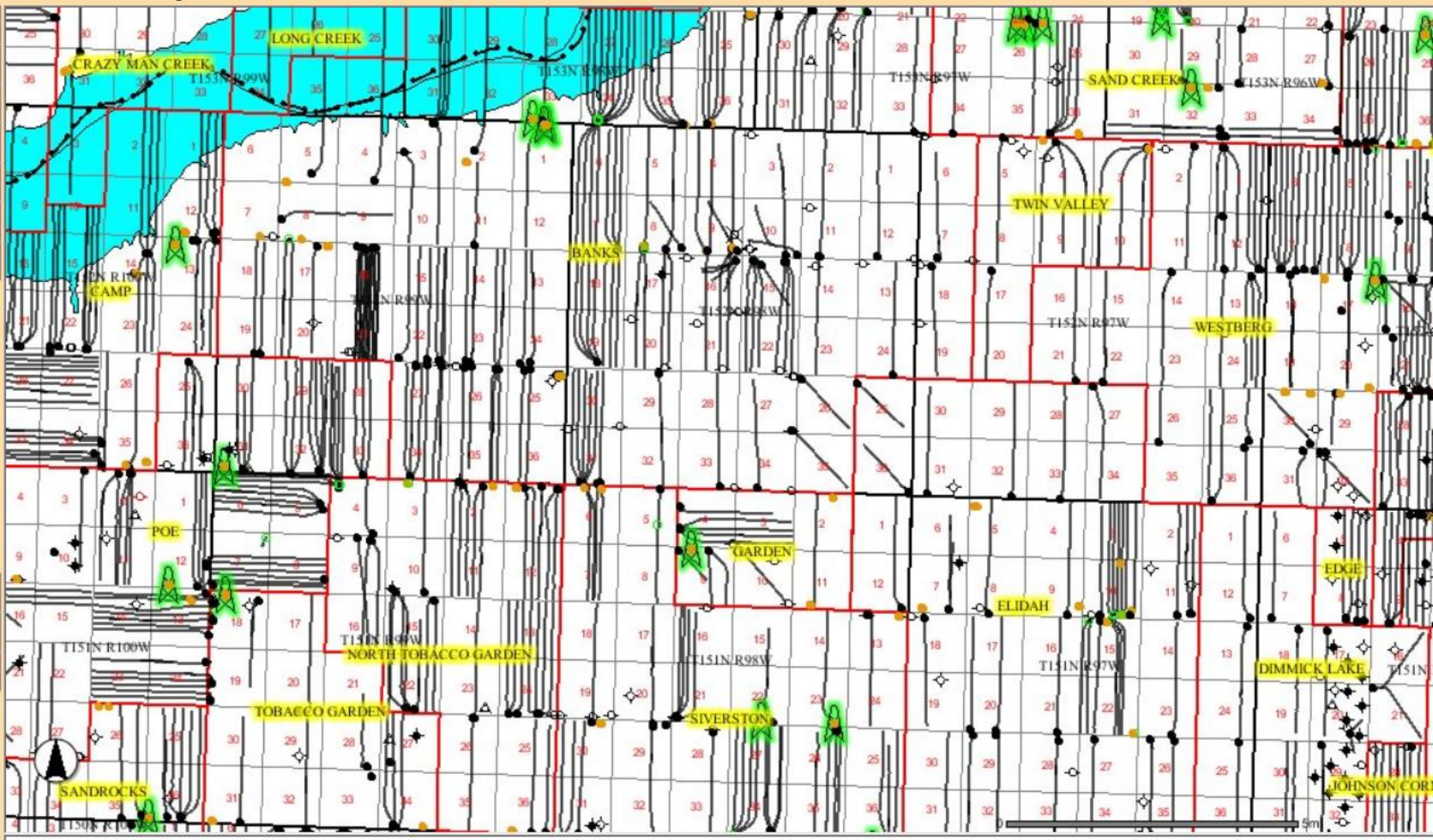


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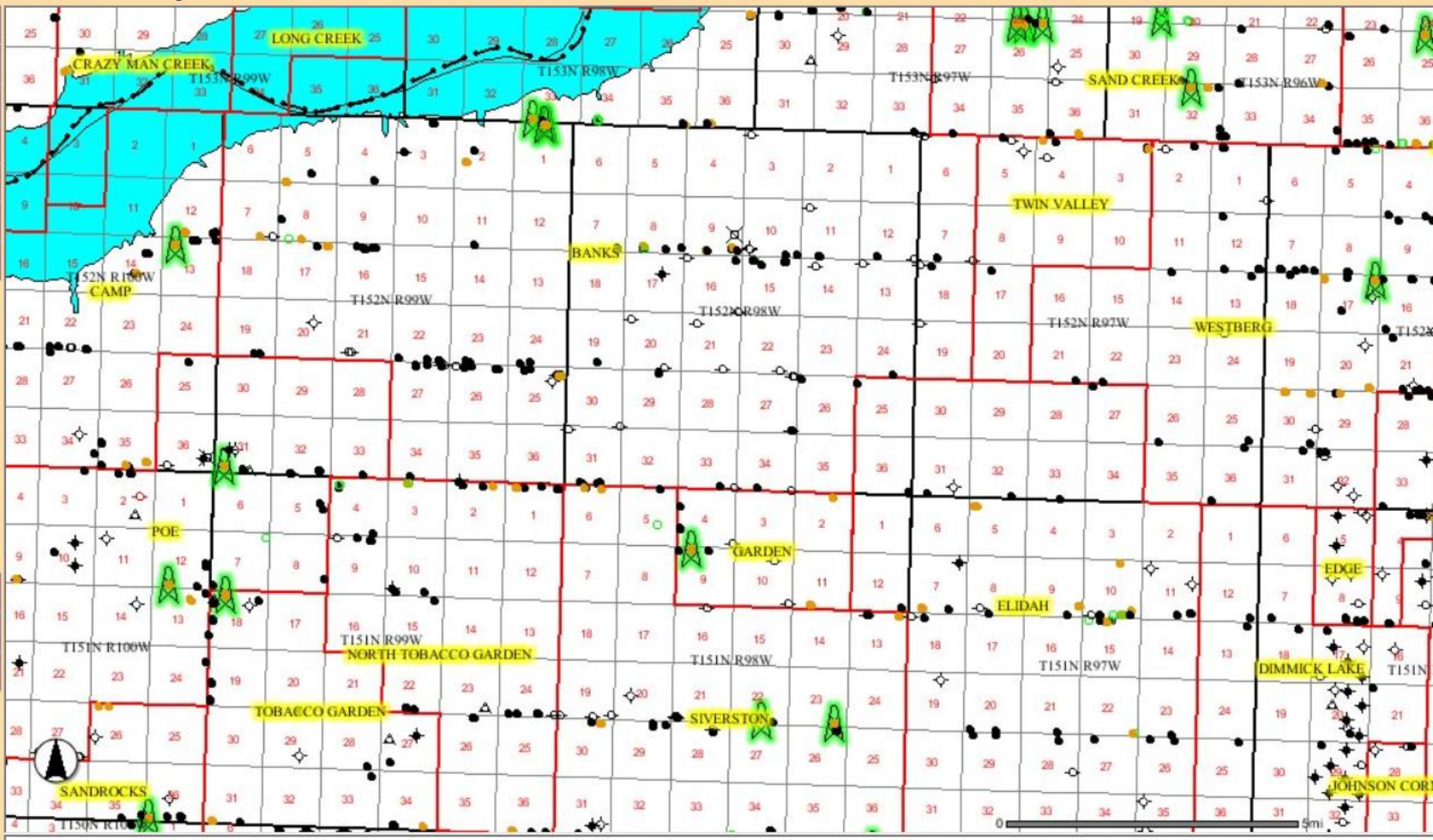


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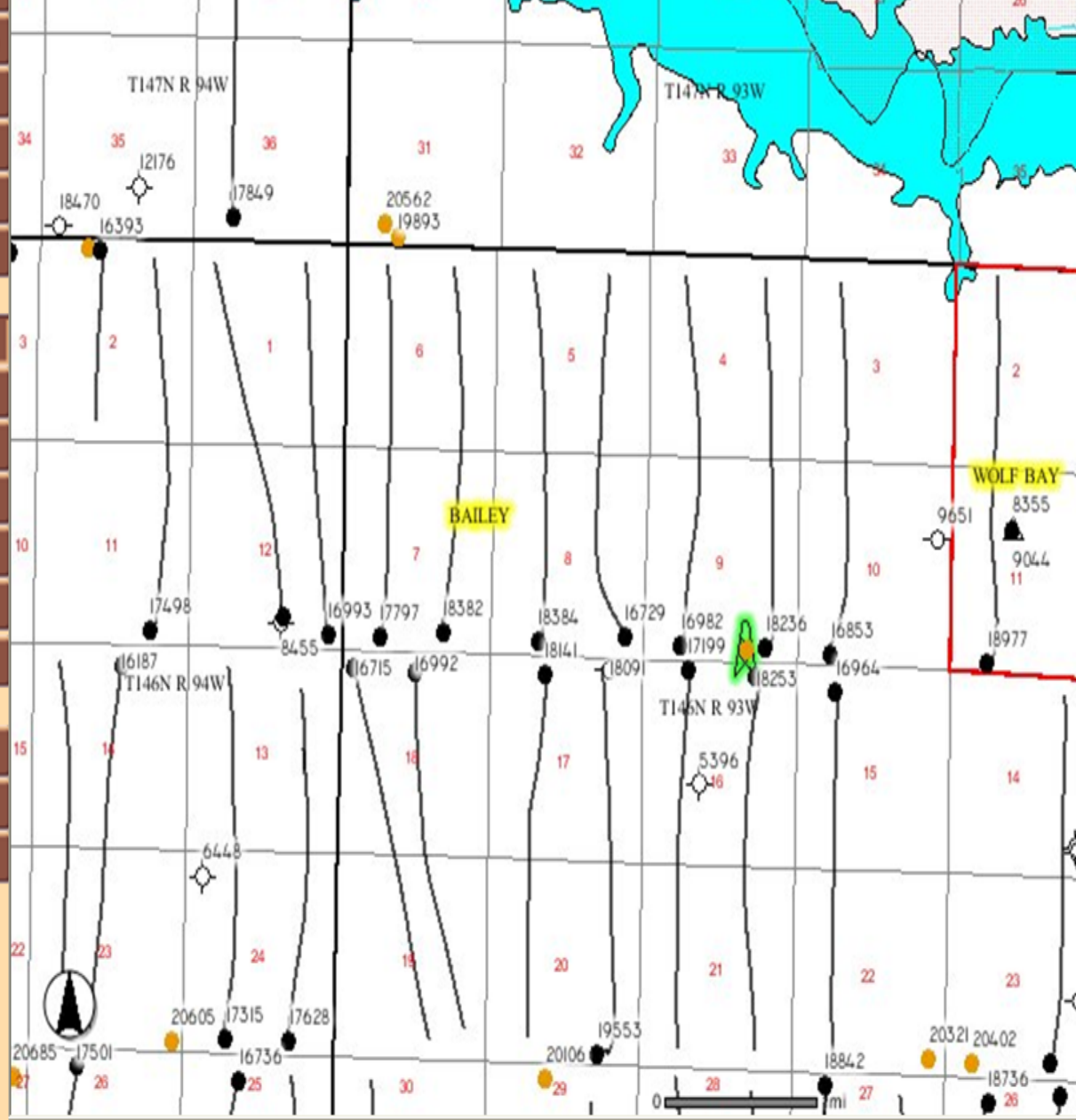


Energy Corridor

- uniform development
- pipelines, electrical, traffic
- less impact on adjacent roads

Vern Whitten Photography

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- Directional Legs
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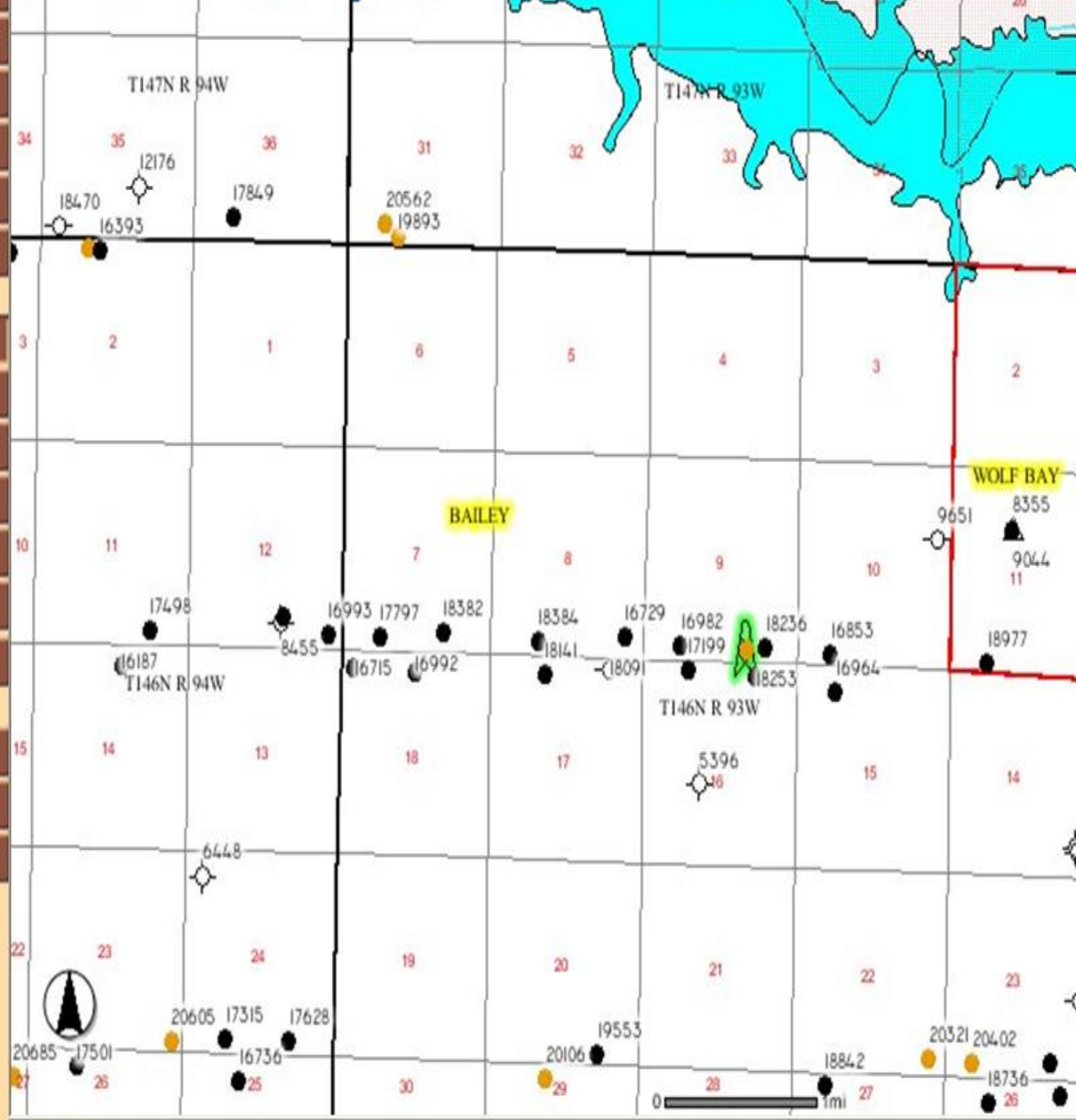
Auto Refresh

Major Rivers  
Selection cleared.

- Help:
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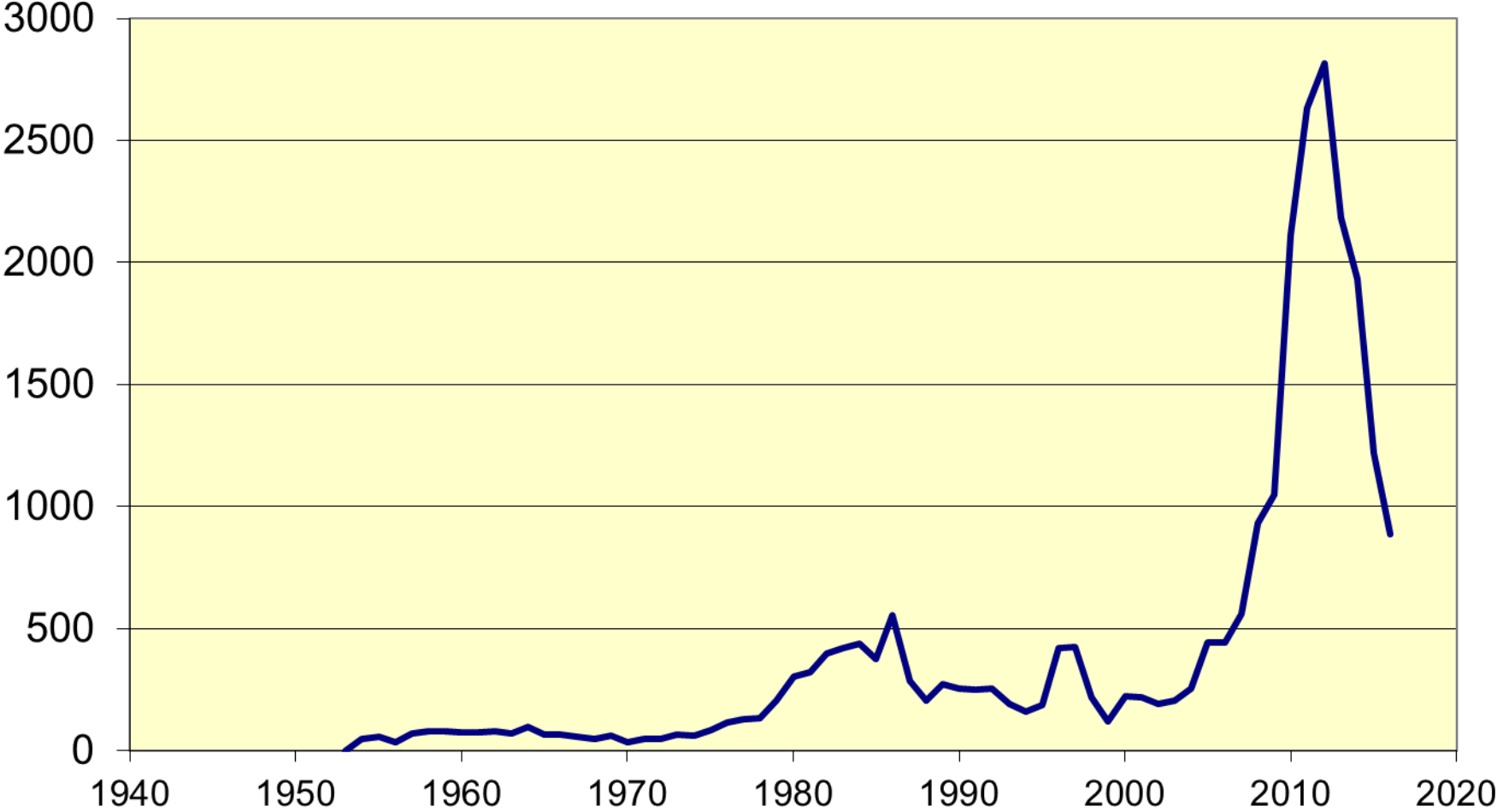
# North Dakota Development

- Regulations
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- **Hearing Procedure**
- Bakken Results





# North Dakota Industrial Commission Cases Heard



# **MONTHLY HEARINGS**

## **Administrative Docket**

- **pooling**
- **increase density wells**
- **saltwater disposal**

## **Regular Docket**

- **hearing examiner—Asst Atty Gen**
- **create 1280-ac spacing unit**
- **create overlapping spacing units**
- **other exceptions to rules**

# **DISPOSING OF CASES**

## **Industrial Commission**

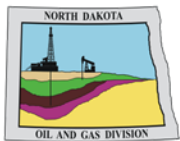
- **Gov, Atty Gen, Comm of Ag**
- **controversial cases**
- **orders denying the appl**
- **orders imposing fines**
- **orders involving unitization**

## **Director of Oil & Gas Division**

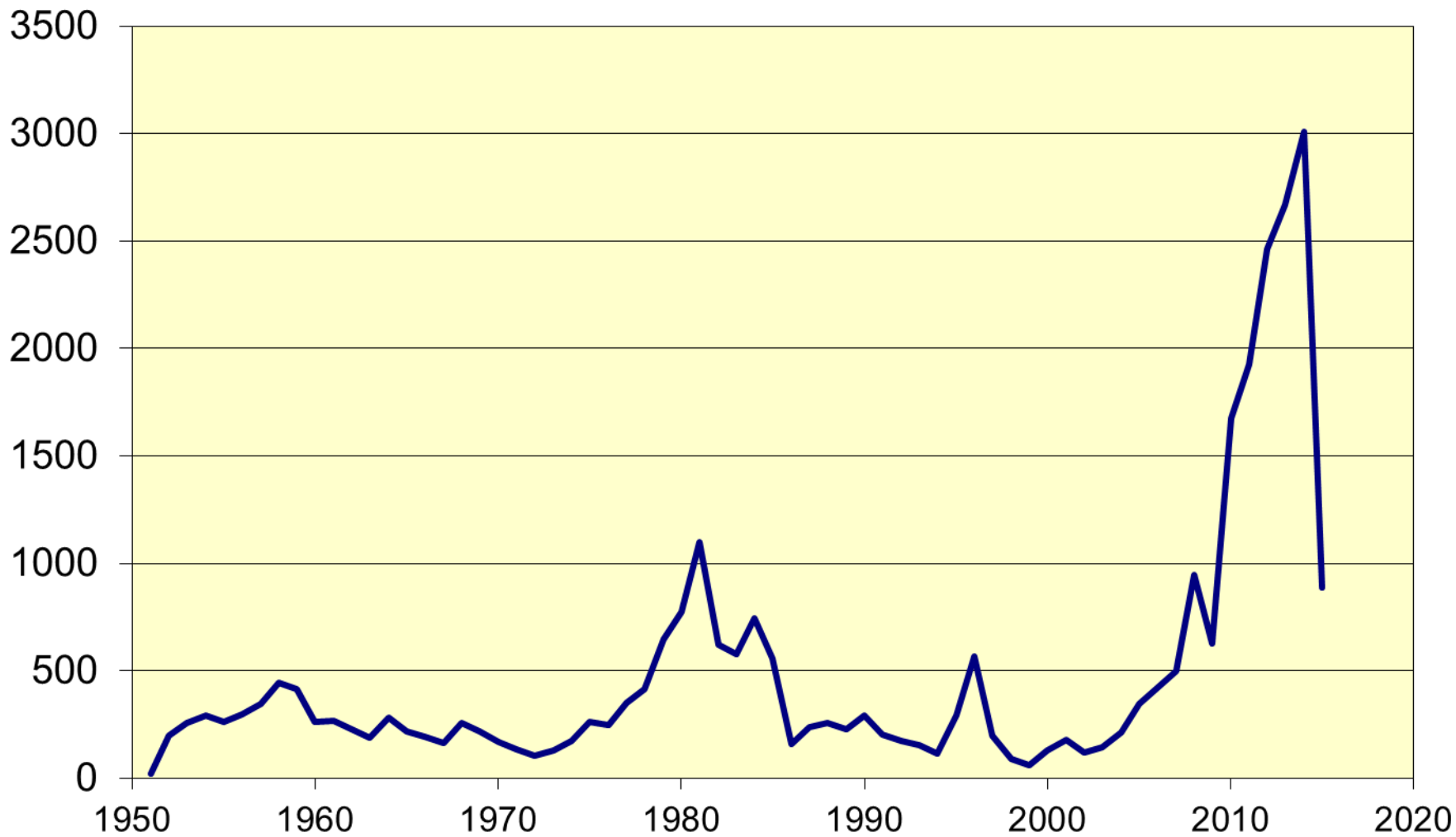
- **routine cases**
- **IC delegated cases**

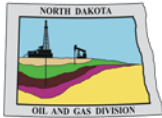
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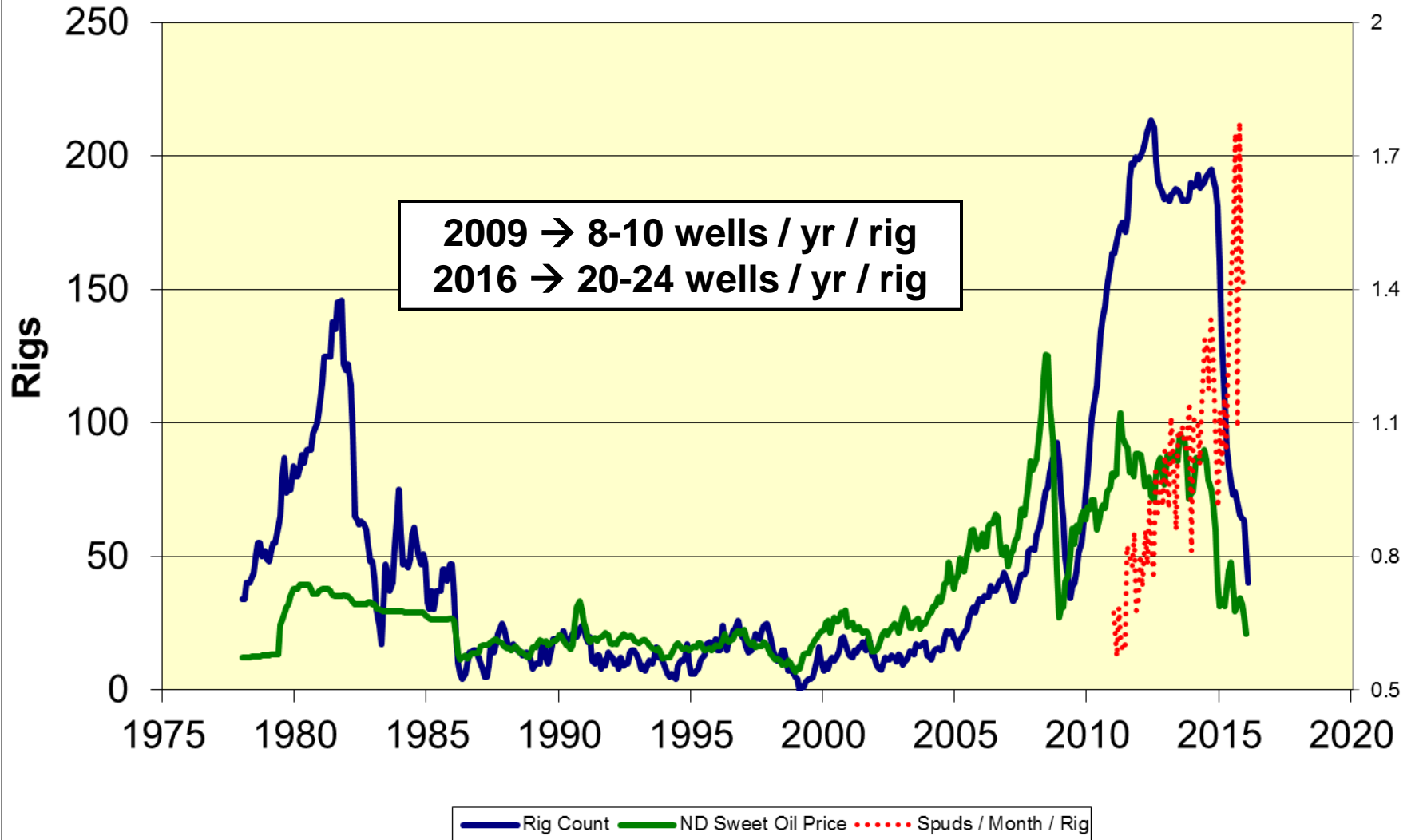


# North Dakota New Well Permits Issued



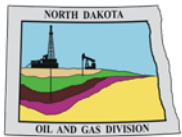


# North Dakota Average Monthly Rig Count

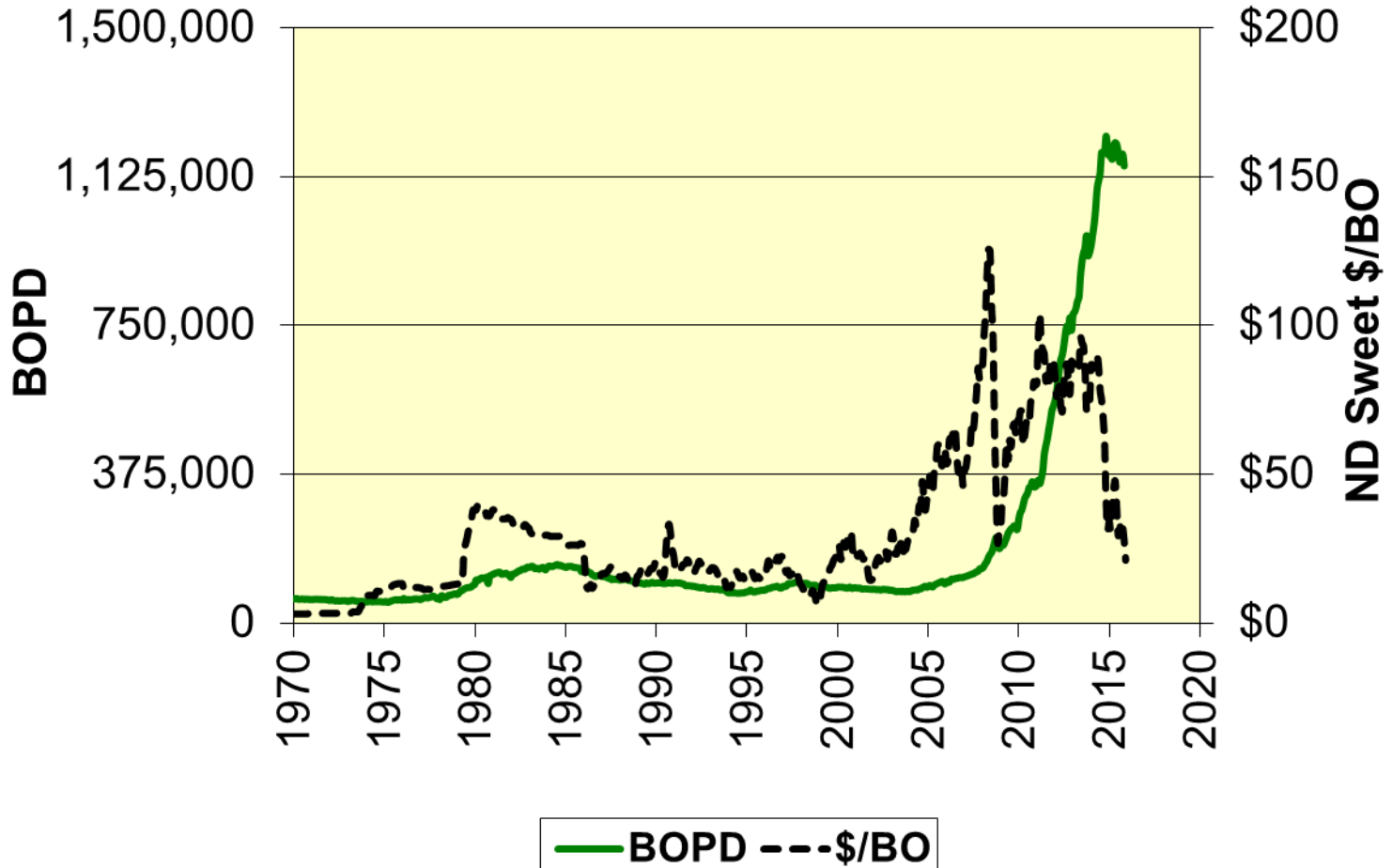


# WELLS

- **13,119 wells currently producing**
  - **10,756 Bakken**
- **40,000 additional development wells**
  - **100 rigs – another 20 years**
- **Bakken Pool: 4 targets = more wells**



## North Dakota Daily Oil Produced and Price

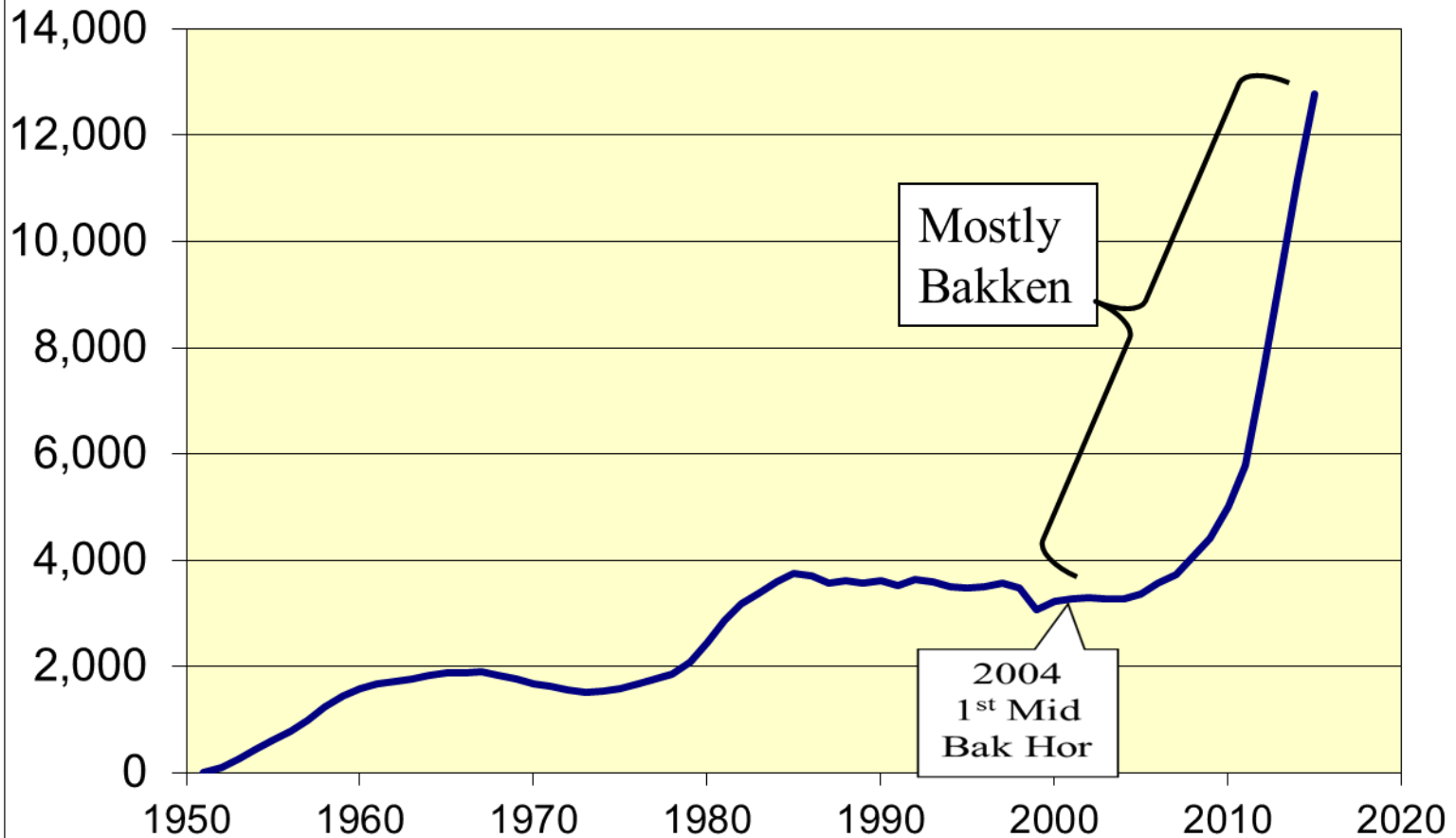


**Dec Production 1,152,280 bopd (appr 1,096,044 Bakken—95%)**

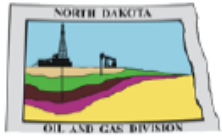




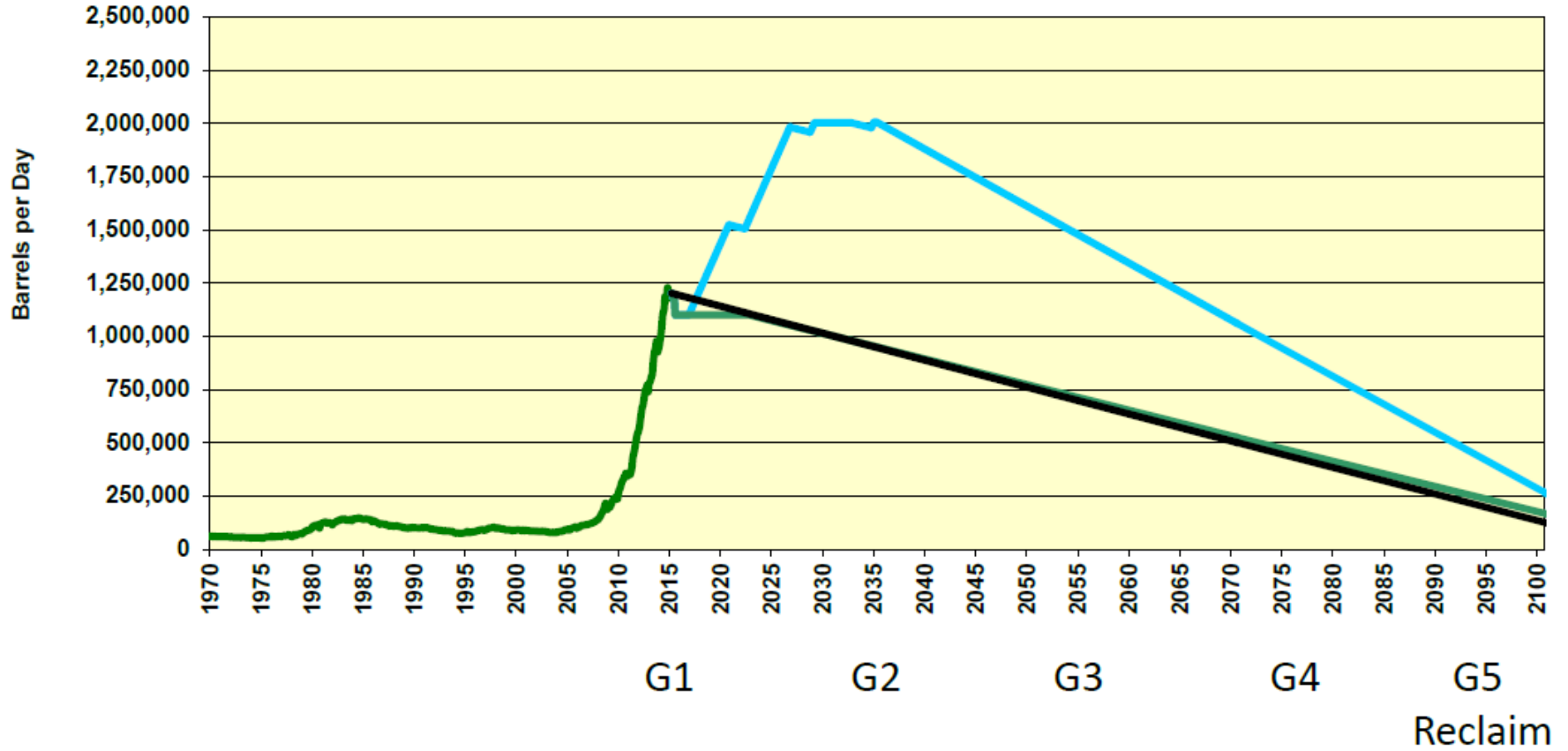
## North Dakota Wells Producing



**13,119 total wells – 10,756 Bakken horizontal (82%)**

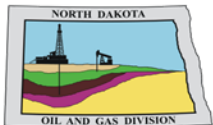


# North Dakota Oil Production

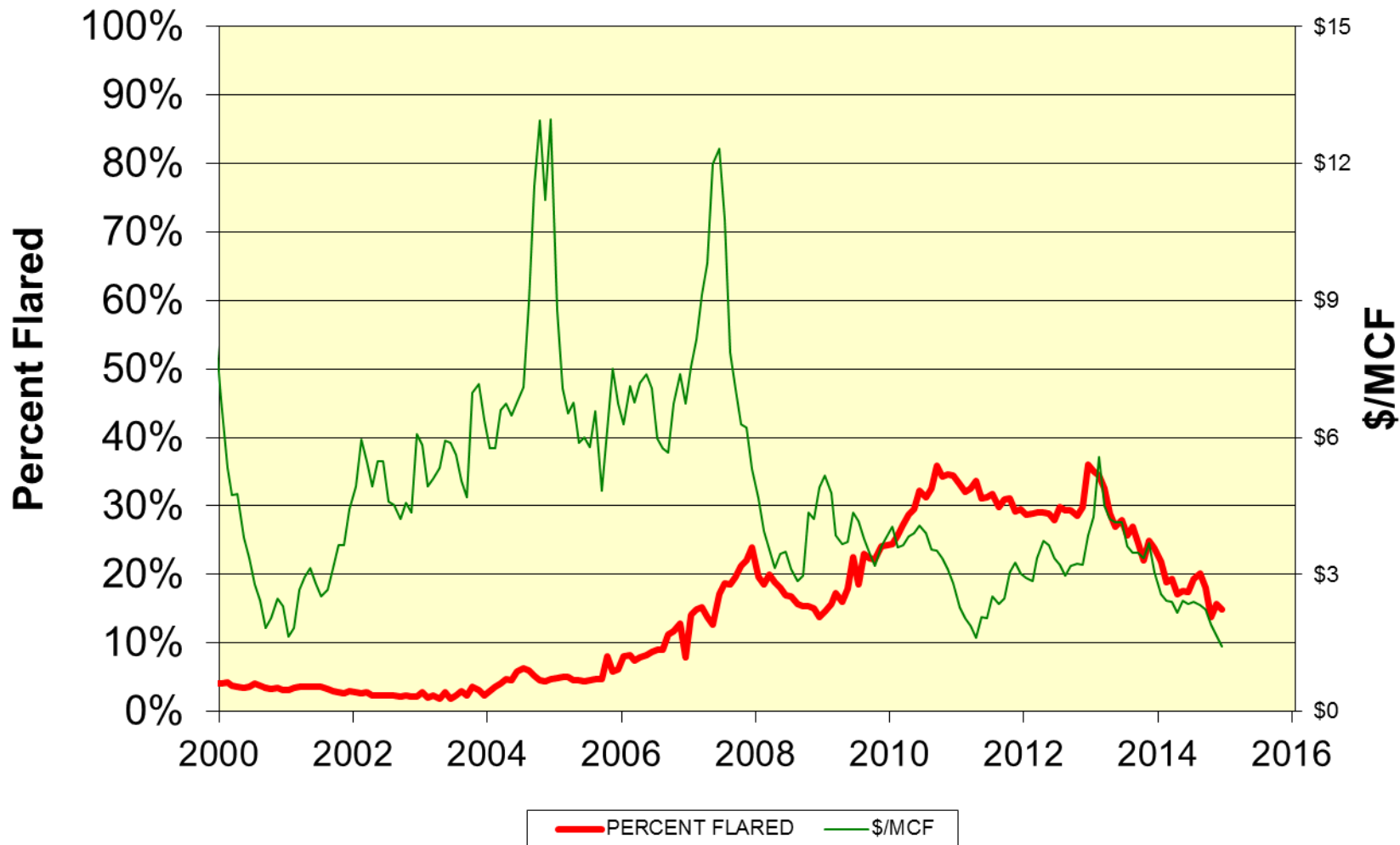


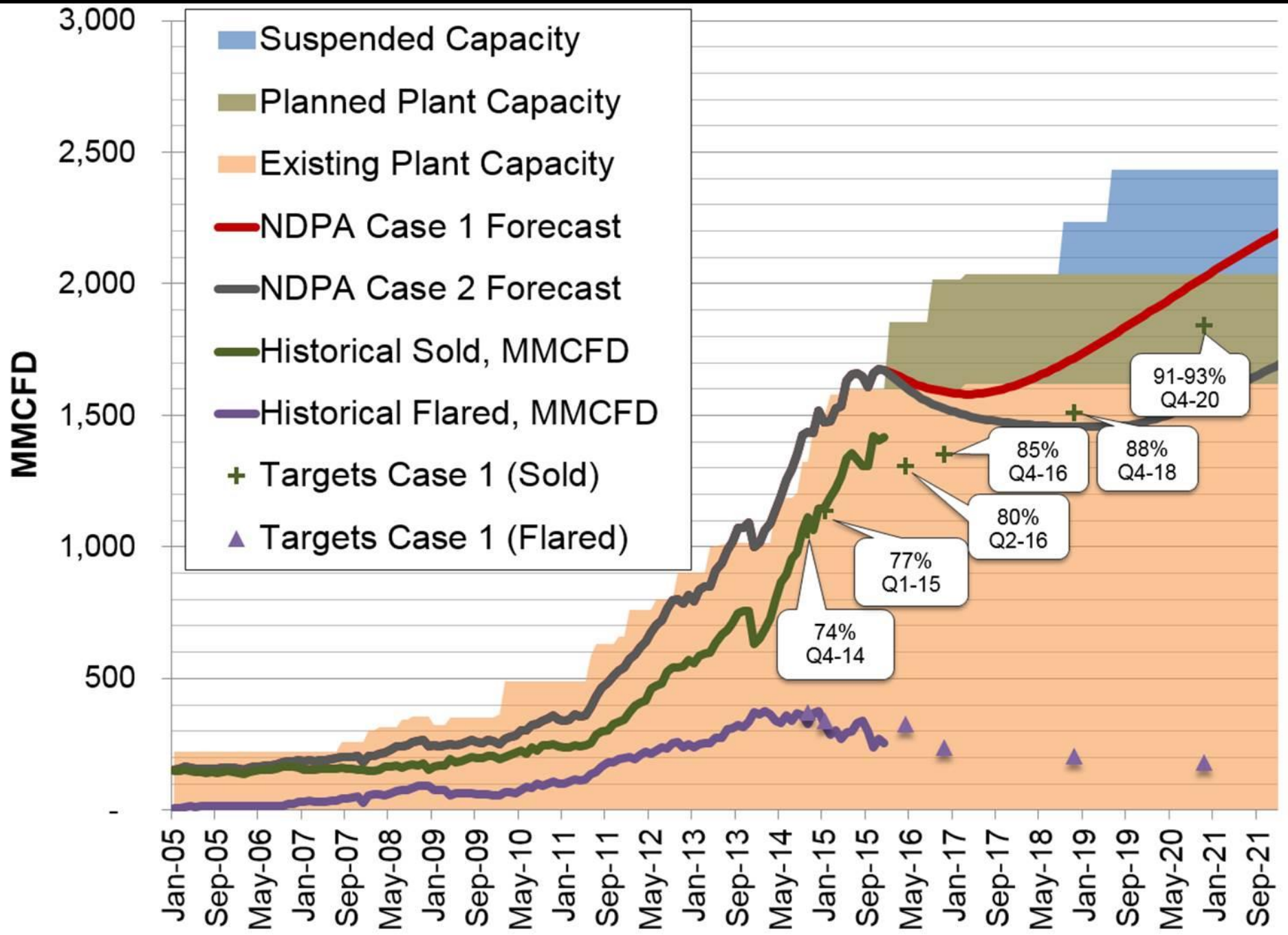
**EOR? +++**





# North Dakota Monthly Gas Flared







# WHAT'S AHEAD

- **Oil price recovery in 2016 / 2017 ?**
- **Spearfish horizontal play**
- **Tyler horizontal play**
- **Three Forks—testing lower benches**
- **Enhanced Recovery in Bakken**

# **INTERNSHIP**

- **Summer 2016**
- **Legal Research**
  - **Deferred Penalty Strategy**
  - **Bankruptcy Issues**
- **480 hours @ \$15/hr**
- **Contact Michael Ziesch—701.328.8020**

# Reclaimed Location

