

Photo Credit: Vern Whitten Photography



Department of Mineral Resources

Mark Bohrer

June 19, 2024

NORTH  
**Dakota** Be Legendary.™

# History

## Abandoned Oil and Gas Well Plugging and Site Reclamation Fund (AWPSRF)

- Started in 1983 NDCC 38-08-04.5
- Historically underfunded by fees, fines, and confiscated bonds. Took many years to clean up locations.
- 80% of the orphaned sites that used CARES Act funding were drilled 1950-1985
- Since 2013 a portion of Gross Production Tax allocated to the fund creating a growing fund balance.
- Now allocate \$15 million a biennium to AWPSRF.
- Industry and State have successfully reclaimed more than 14,552 wells and sites.
  - 2,600 sites in progress pending final approval.
- State has successfully reclaimed more than 360 wells and sites.
  - \$50 Million CARES Act funds plugged 258 wells and reclaimed 173 sites
  - \$5.9 Million Bond Forfeitures plugged 50 wells and reclaimed 70 sites
  - \$36.4 Million AWPSRF plugged 60 wells and reclaimed 118 sites
  - \$17 Million IIJA Initial Grant (\$25 Million) plugged 73 wells, reclaimed 53 sites. 49 sites to finish in 2024
- Worked with Terracon and NDSU to develop a process and long-term plan to restore salt damaged lands at a cost of \$1.7 million.
  - Terracon has completed 2 brine pond sites, and the outcome has been successful. \$1.2 million spent
  - One more site was started this spring
  - 70% of IIJA Formula Grant Phase I money will be spent to restore all known sites, beginning 2025<sub>2</sub>

# 2023-2025 GOALS

## Abandoned Well and Site Restoration

▪ <b>June 30, 2023, fund balance</b>		<b>\$25,312,303</b>
▪ Fees, fines, and forfeitures	5,539,117	
▪ Gross Production Tax distribution	7,500,000	
▪ ARPA and IIJA Initial Grants Revenue	15,640,080	
▪ ARPA and IIJA Initial Grants Work	-15,596,135	
▪ Plugging and reclamation work	-3,172,373	
▪ Evaporation pit remediation (legacy brine pits)	-1,638,071	
▪ Ag Dept Pipeline Ombudsman Program	-34,412	
▪ Ag Dept Royalty Oversight Program	-70,568	
▪ Miscellaneous (credit card fees)	-6,052	
▪ <b>Estimated June 30, 2024, fund balance</b>		<b>\$33,473,916</b>
▪ Future Gross Production Tax distribution	7,500,000	
▪ ARPA and IIJA Initial & Formula Grants Revenue	11,360,000	
▪ ARPA and IIJA Initial & Formula Grants Work	-11,404,000	
▪ Plugging and reclamation work	-1,500,000	
▪ Evaporation pit remediation (legacy brine pits)	-1,400,000	
▪ Transfer to DEQ Environmental Quality Restoration Fund	-400,000	
▪ Remaining Ag Dept Pipeline Ombudsman Program	-165,588	
▪ Remaining Ag Dept Royalty Oversight Program	-429,433	
▪ <b>Anticipated June 30, 2025, fund balance</b>		<b>\$37,434,817</b>

# 5-10 year Goals

## Abandoned Well and Site Restoration

- “Vision Zero” for spills. Encourage operators/owners to use new technologies for leak detection, protection, and monitoring to prevent pipeline spills and minimize the damage from any that do happen.
- Reduce physical inspections through the use of drone technology for all but final release inspections.
- Reduce excavate and replace method of spill restoration and replace with bioremediation when possible.
- Annual operator meetings concerning asset management and asset retirement to improve tracking.
  
- Implement Terracon process and long-term plan to restore salt damaged lands.
  - Continue to monitor full site projects.
  
- 2024-2029 use IJA funds to plug 50 wells, reclaim 116 Sites, and remediate 166 brine impacted sites at an estimated cost of \$100 million
  - Use Terracon’s developed plan to finish remediation of 105 brine ponds; goal is to finish during 2026.

# CONSTRAINTS

## **Abandoned Well and Site Restoration**

- Gross Production Tax allocation.
- Litigation.



- **Statistics**
- **The Next 10 Years** (Bakken Development & EOR) (Legacy EOR)

## Oil Production

March 1,129,539 barrels/day (final)  
April 1,241,106 barrels/day (all-time high 1,519,037 BOPD Nov 2019)

Revenue Forecast 1,100,000 barrels/day at \$70/barrel  
GPT+OET+ST+IT > 52% of total State Tax Revenue

## Gas Production and Capture

March Production 3,392,549 MCF/day  
95% Capture 3,221,999 MCF/day  
April Production 3,490,476 MCF/day (all-time high 3,582,821 MCFD Dec 2023)  
95% Capture 3,328,104 MCF/day (all-time high 3,355,110 MCFD Dec 2023)

## April Gas Capture

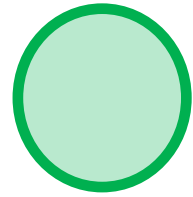
Statewide 95%  
Statewide Bakken 96%  
Non-FBIR Bakken 95%  
FBIR Bakken 97%  
Trust FBIR Bakken 97%  
Fee FBIR 96%

# Permits

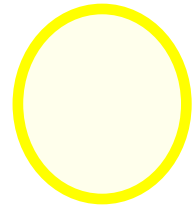
March	72 drilling and 2 seismic
April	79 drilling and 2 seismic
May	95 drilling and 0 seismic (all-time high 370 in 10/2012)

## Rig Count

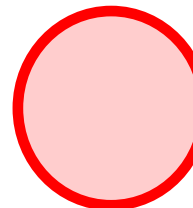
March	40
April	38
May	37 (all-time high 218 on 5/29/12)
Federal surface	0



Core=Tier 1  
 90% developed  
 +7,000 wells  
 1-2% growth = 40 rigs = 5 years  
 EOR – U – Riverbed – Straddle Wells

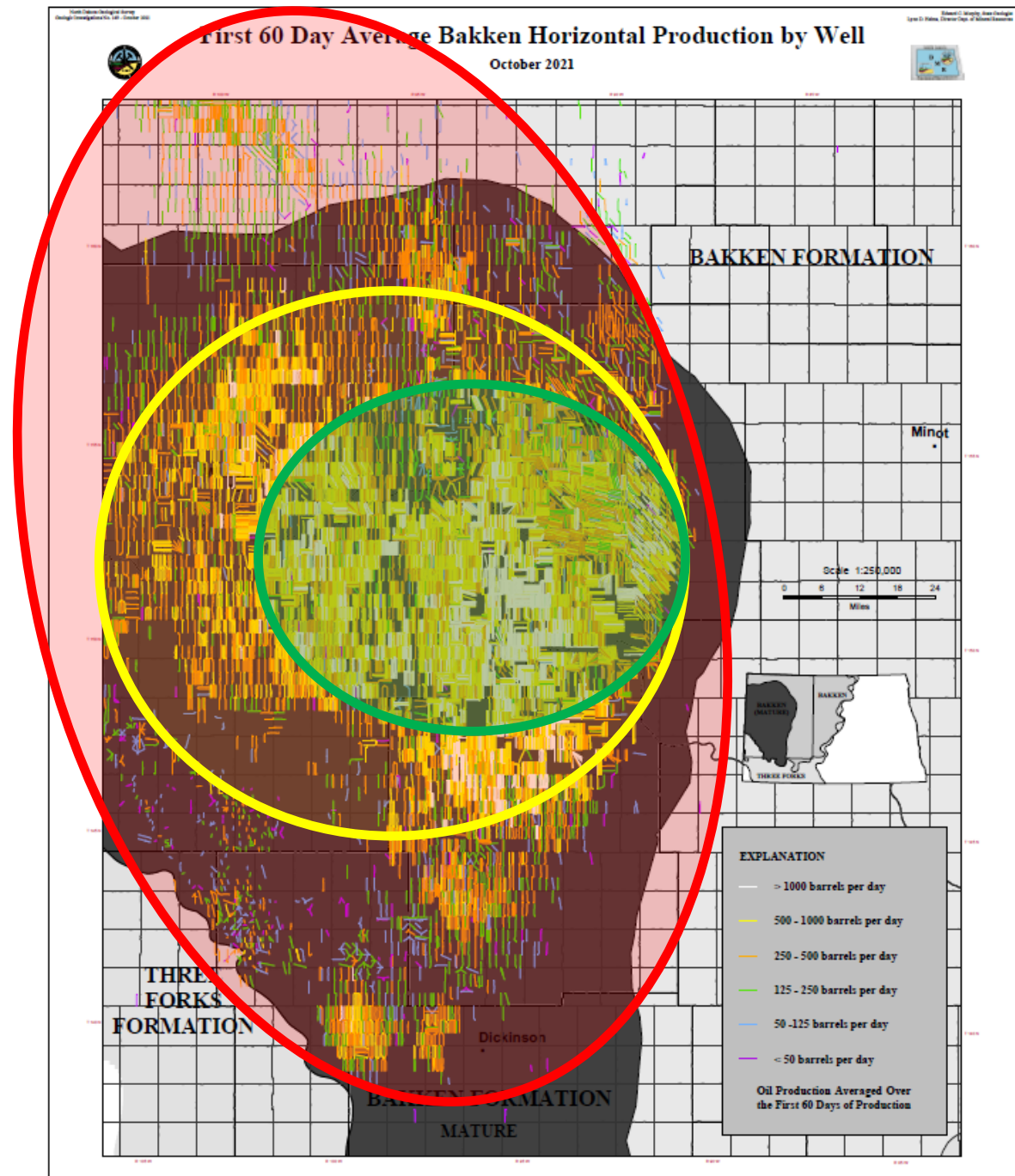


Tier 2  
 55% developed  
 +7,000 wells  
 1-2% growth = 40 rigs = 5 years  
 3-mile laterals & federal minerals



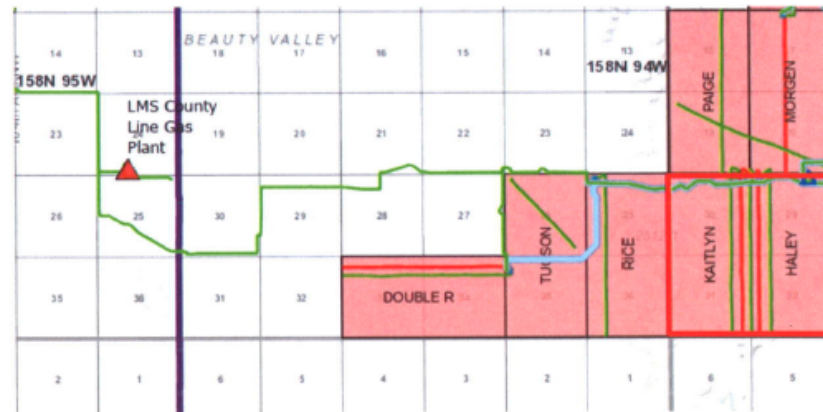
Tier 3  
 25% developed  
 +7,000 wells  
 1-2% growth = 40 rigs = 5 years  
 3&4-mile laterals & federal minerals

Total = 21,000 wells & 15 years  
 Current 19,000 wells in 18 years



# East Tioga

## Features of Project Location



- 2560-acre Spacing Unit of Interest
- Existing Middle Bakken Horizontal
- Existing Three Forks Horizontal
- Existing Gas Pipeline (LMS)
- Existing Water Pipeline (LMS)

- Location selected based on results and learnings from prior Bakken EOR pilots, specifically the “Stomping Horse” pilot documented in NDIC Case No. 27926.
- Utilizes more recently completed infill wells (August ‘19); limited depletion.
- Accesses rich gas via connection to the gas plant gathering line.
- Liberty operates most of the offsetting DSUs.
- Well & completion design provides for favorable conformance along the horizontal interval using cemented liners with “Plug & Perf” completions.
- Jet pump operations ease well conversion to injection.
- Offset well configuration allows for surveillance and boundaries.

INDUSTRIAL COMMISSION  
STATE OF NORTH DAKOTA  
DATE 6-17-21 CASE NO. 28830  
Prepared by Liberty  
Exhibit E-2  
Identified By Rospigil



# Big Butte

## Location Map – Hess WI





**Injection Schedule**

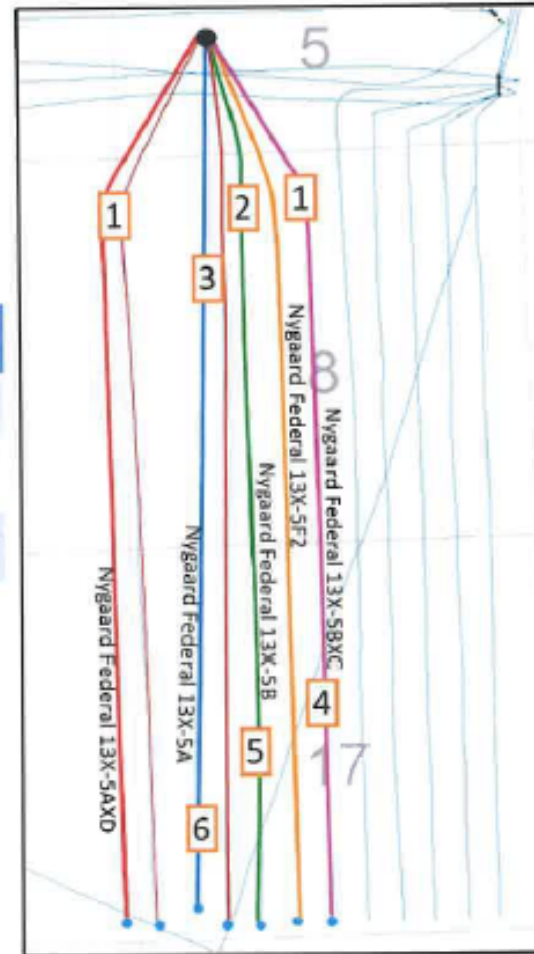
Four Nygaard Federal 13X-5 Middle Bakken wells to be used for treatment

- 5AXD – Surfactant ONLY (no gas)
- 5A, 5B, 5BXC – Surfactant and gas Co-Injection

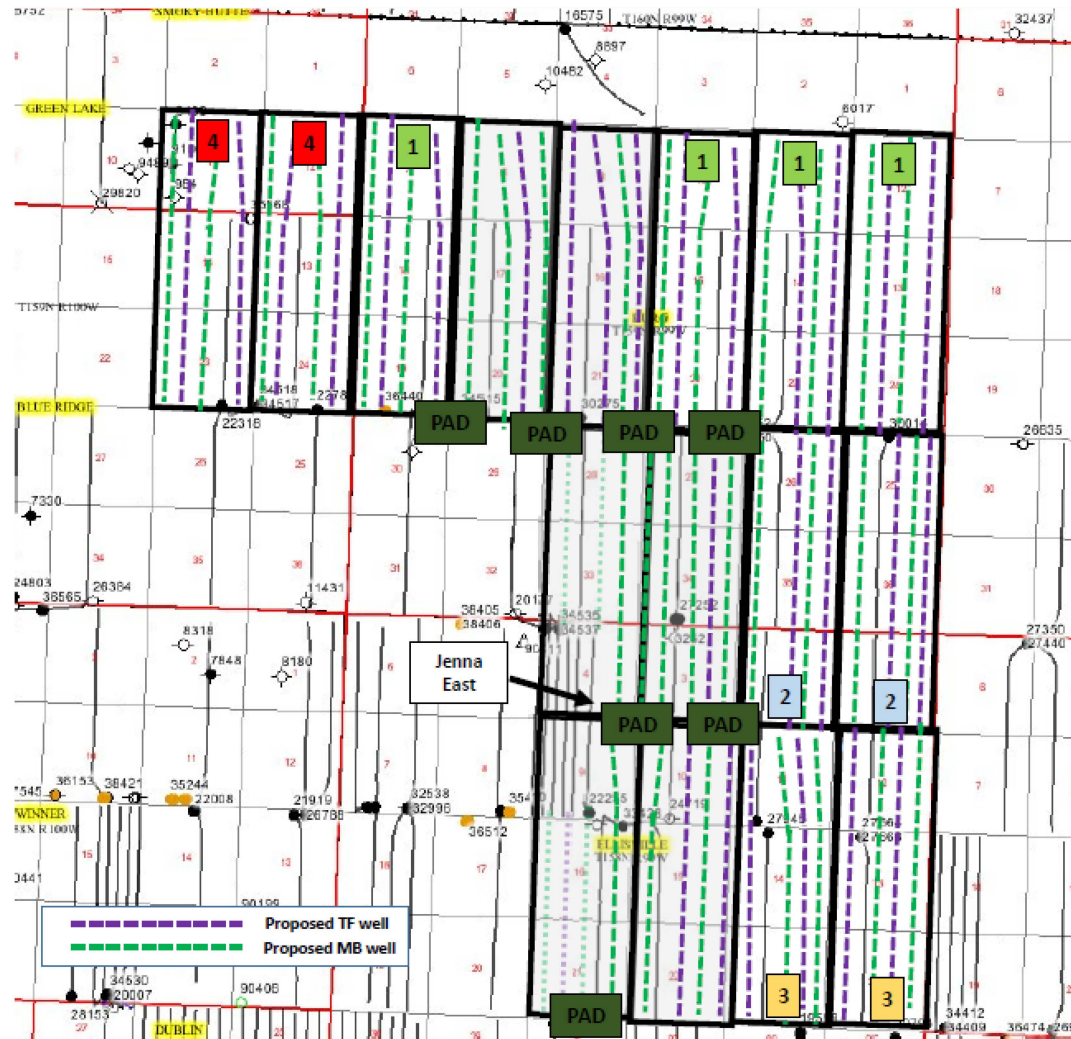
WELL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER
5AXD	surfactant					
5A			Co-injection			Co-injection
5B		Co-Injection			Co-Injection	
5BXC	Co-injection			Co-Injection		

Starting May 2024 through October 2024 (only operating through “good weather window”)

1. Treat first co-injection well (5BXC) and then control well (5AXD, surfactant only)
2. Approximately one month later, treat second co-injection well (5B)
3. Approximately one month later, treat third co-injection well (5A)
4. Approximately one month later, repeat treatment in first co-injection well (5BXC)
5. Approximately one month later, repeat treatment in second co-injection well (5B)
6. Approximately one month later, repeat treatment in third co-injection well (5A)



Lost Bridge



Legend	Case Status
	Heard in May/June 2021
1	28855
2	28856
3	28857
4	28858

Kraken Operating, LLC  
 Case Nos. 28855, 28856,  
 28857, 28858  
 July 28, 2021  
 Supp. Exhibit A



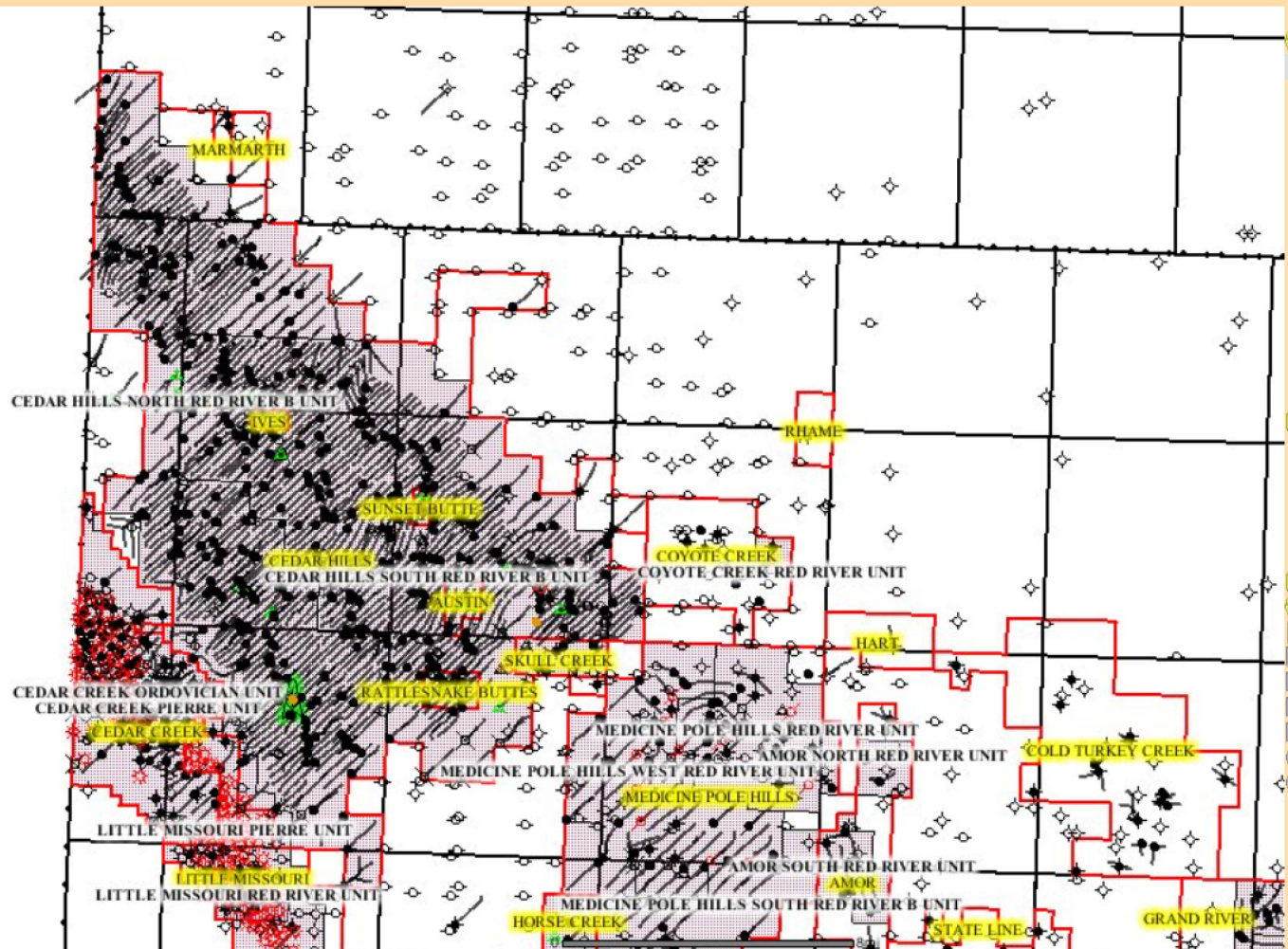
# Oil and Gas : ArcIMS Viewer

- 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

- Browser Settings
- Suggestion



- ### 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

Refresh Map

Auto Refresh

Help:

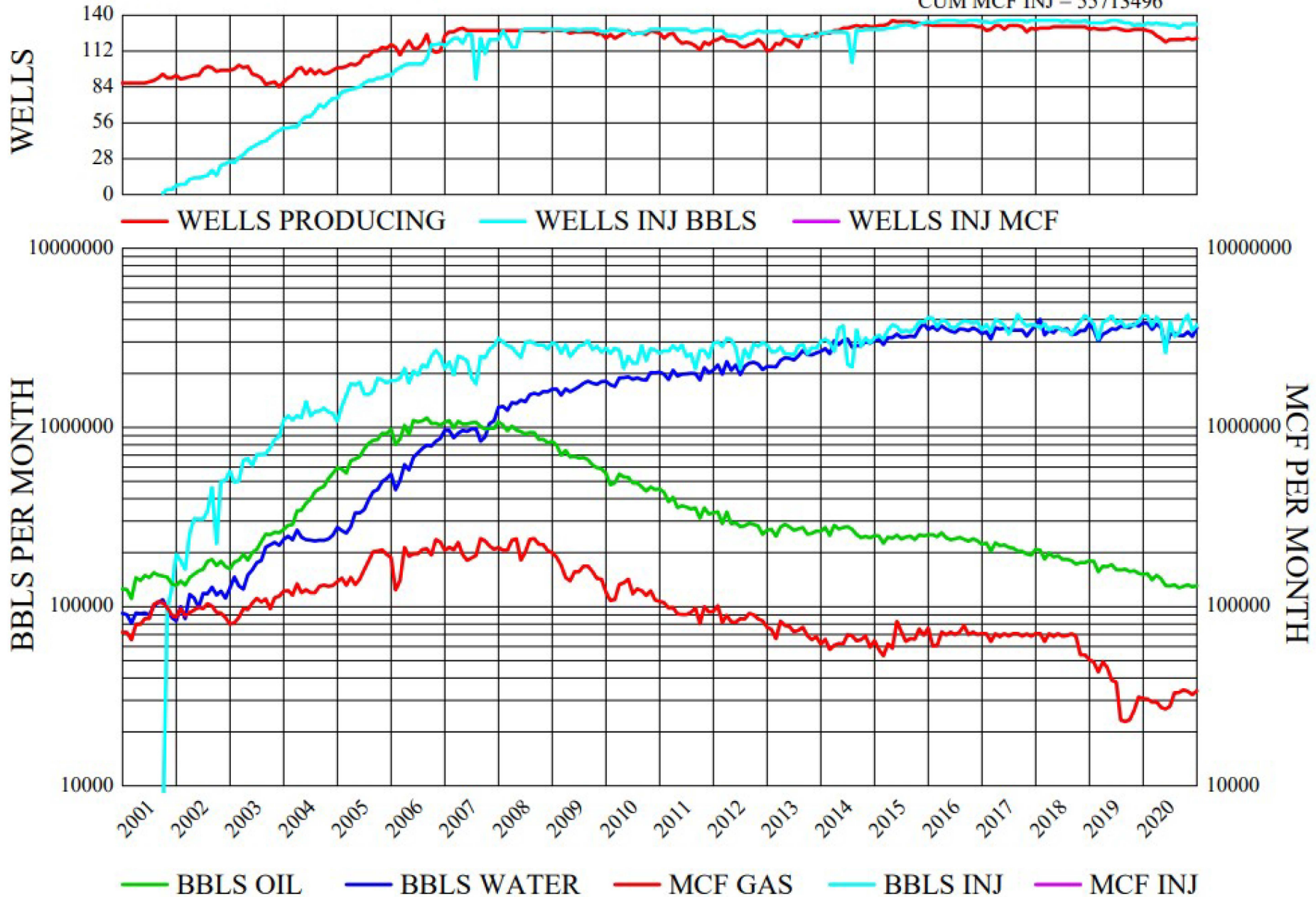
- A closed group, click to open.
- An open group, click to close.
- A map layer.
- A hidden group/layer, click to make visible.
- A visible group/layer, click to hide.
- A visible layer, but not at this scale.
- A partially visible group, click to make visible.
- An inactive layer, click to make active.
- The active layer.

<input checked="" type="radio"/>	<a href="#">CEDAR HILLS</a>	oilGas	<a href="#">Print</a>
<input type="radio"/>	<a href="#">CENTENNIAL</a>	oilGas	<a href="#">Print</a>
<input type="radio"/>	<a href="#">CHAMA</a>	oilGas	<a href="#">Print</a>
<input type="radio"/>	<a href="#">CHARBONNEAU</a>	oilGas	<a href="#">Print</a>
<input type="radio"/>	<a href="#">CHARLIE BOB</a>	oilGas	<a href="#">Print</a>

Find

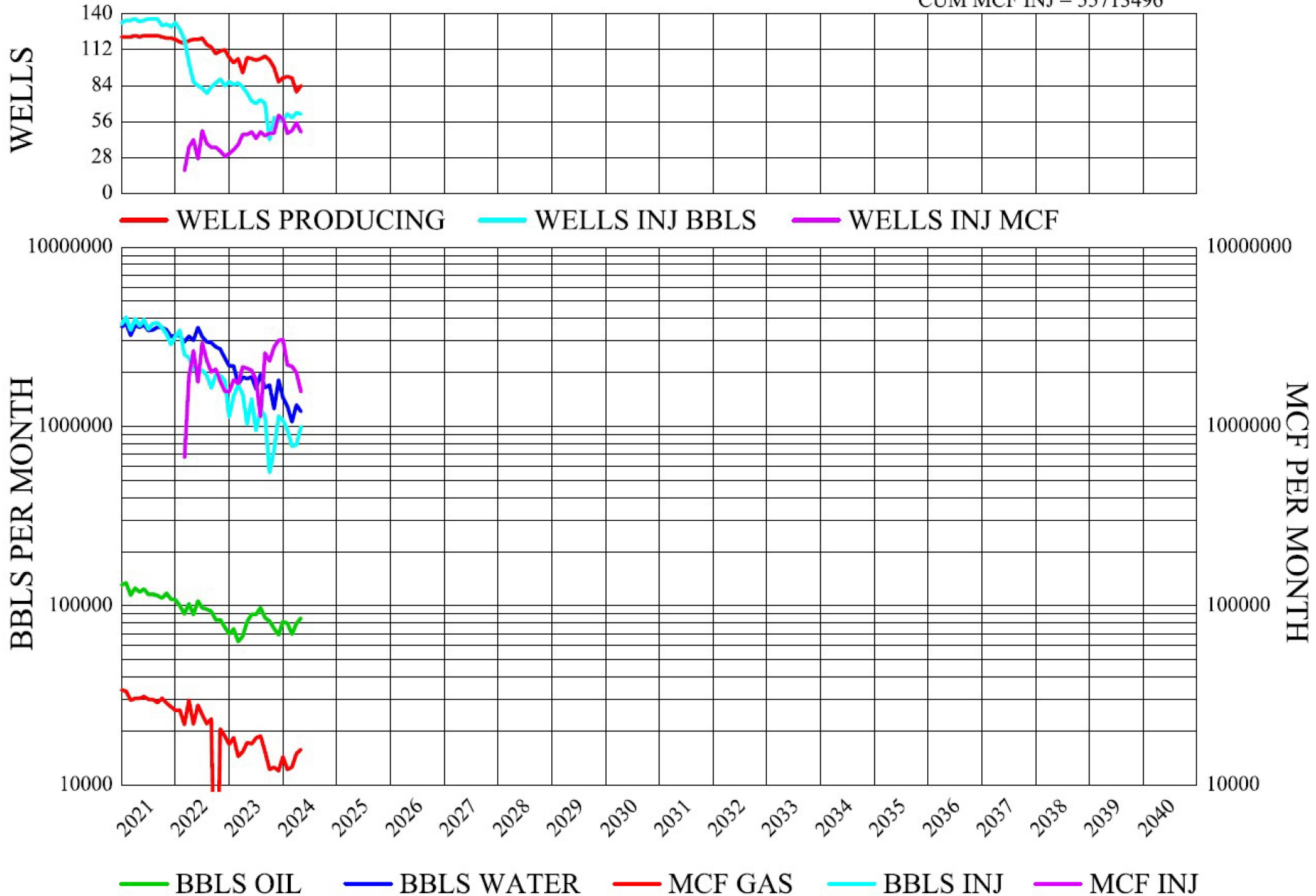
# CEDAR HILLS SOUTH RED RIVER B UNIT

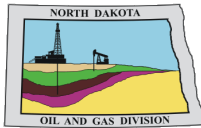
CUM OIL = 115843207  
 CUM WATER = 566043449  
 CUM GAS = 31116192  
 CUM BBLs INJ = 688048440  
 CUM MCF INJ = 55713496



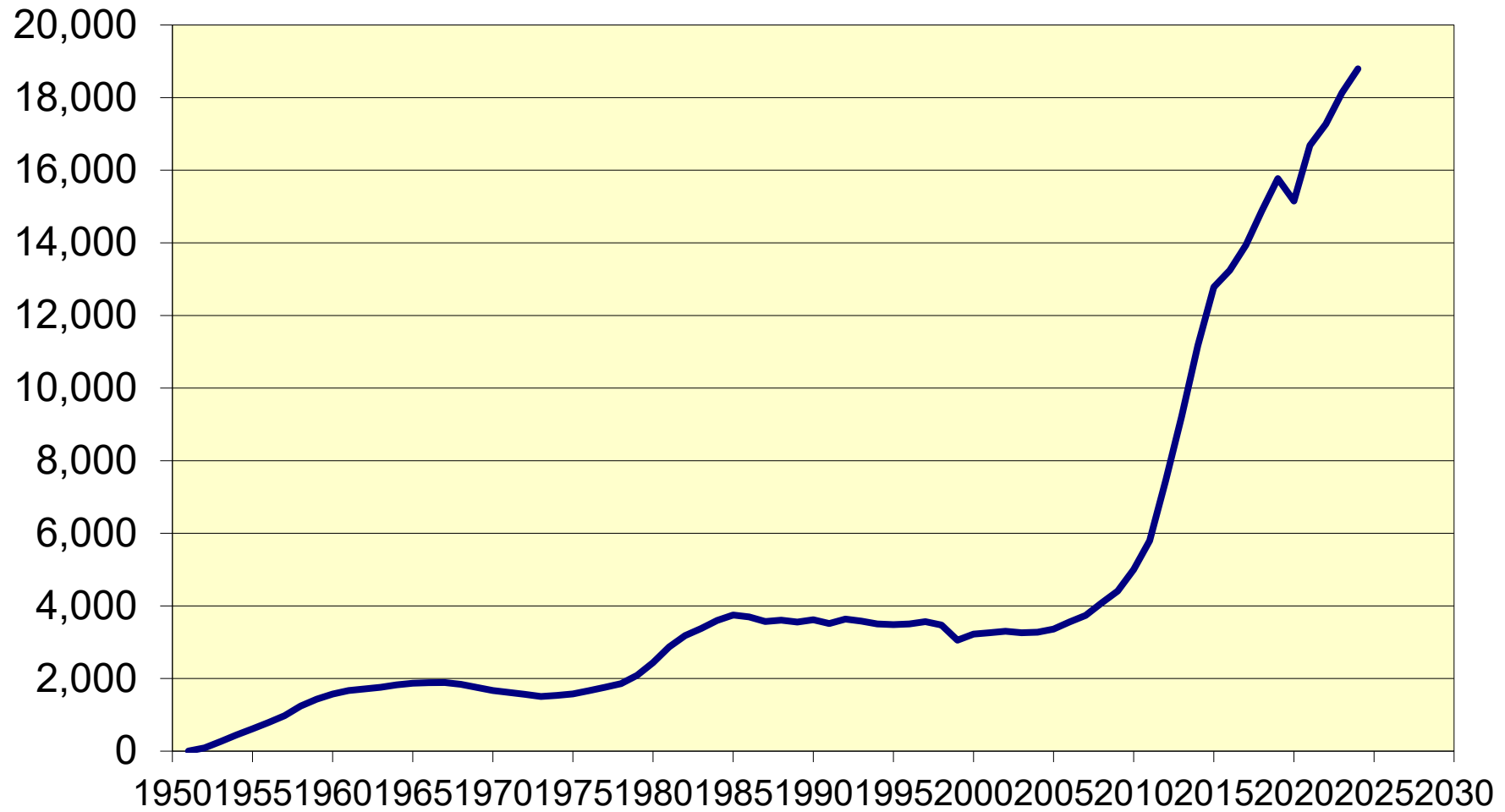
# CEDAR HILLS SOUTH RED RIVER B UNIT

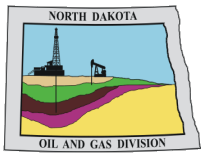
CUM OIL = 115843207  
 CUM WATER = 566043449  
 CUM GAS = 31116192  
 CUM BBL INJ = 688048440  
 CUM MCF INJ = 55713496



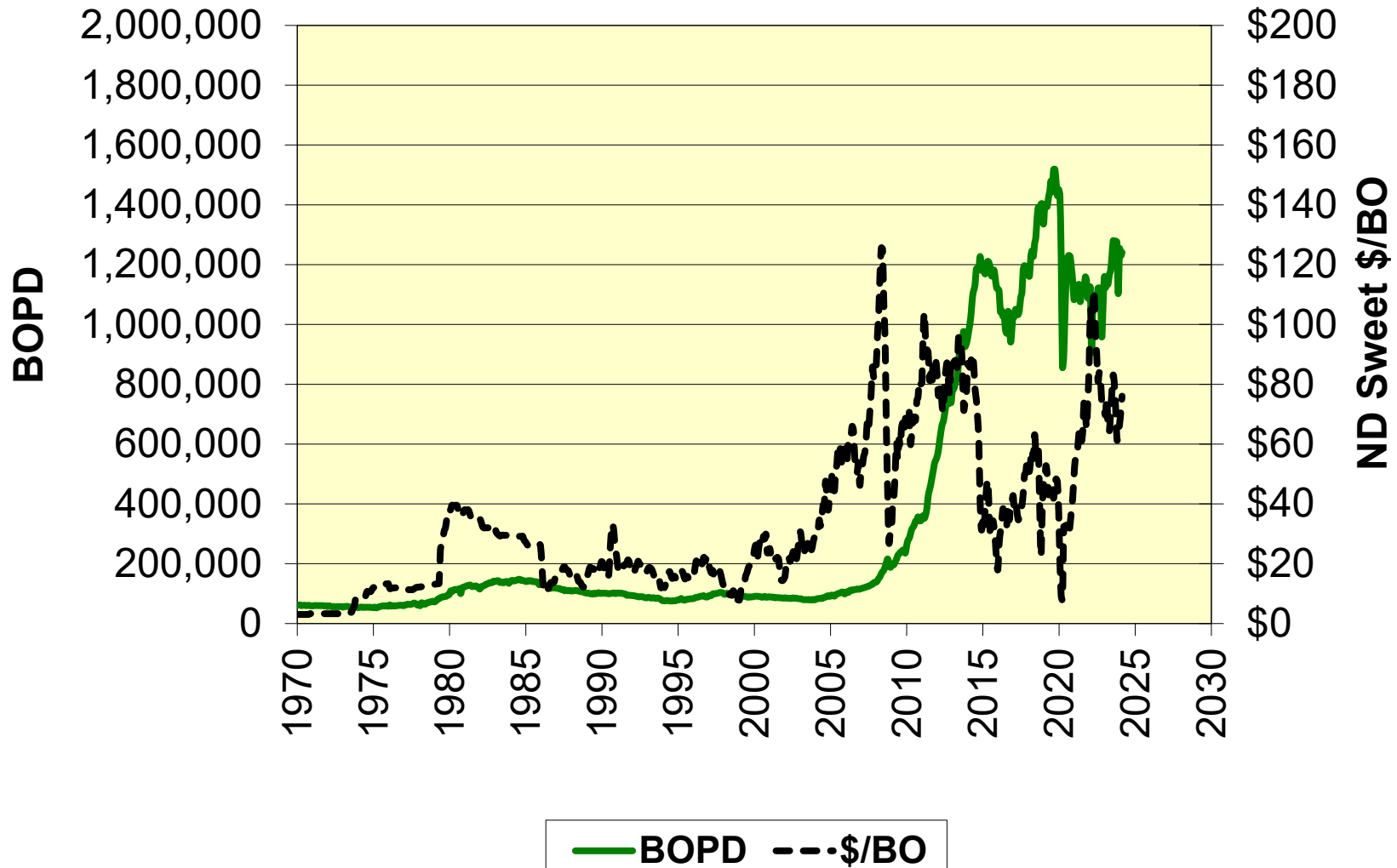


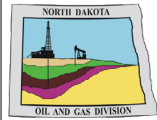
## North Dakota Wells Producing



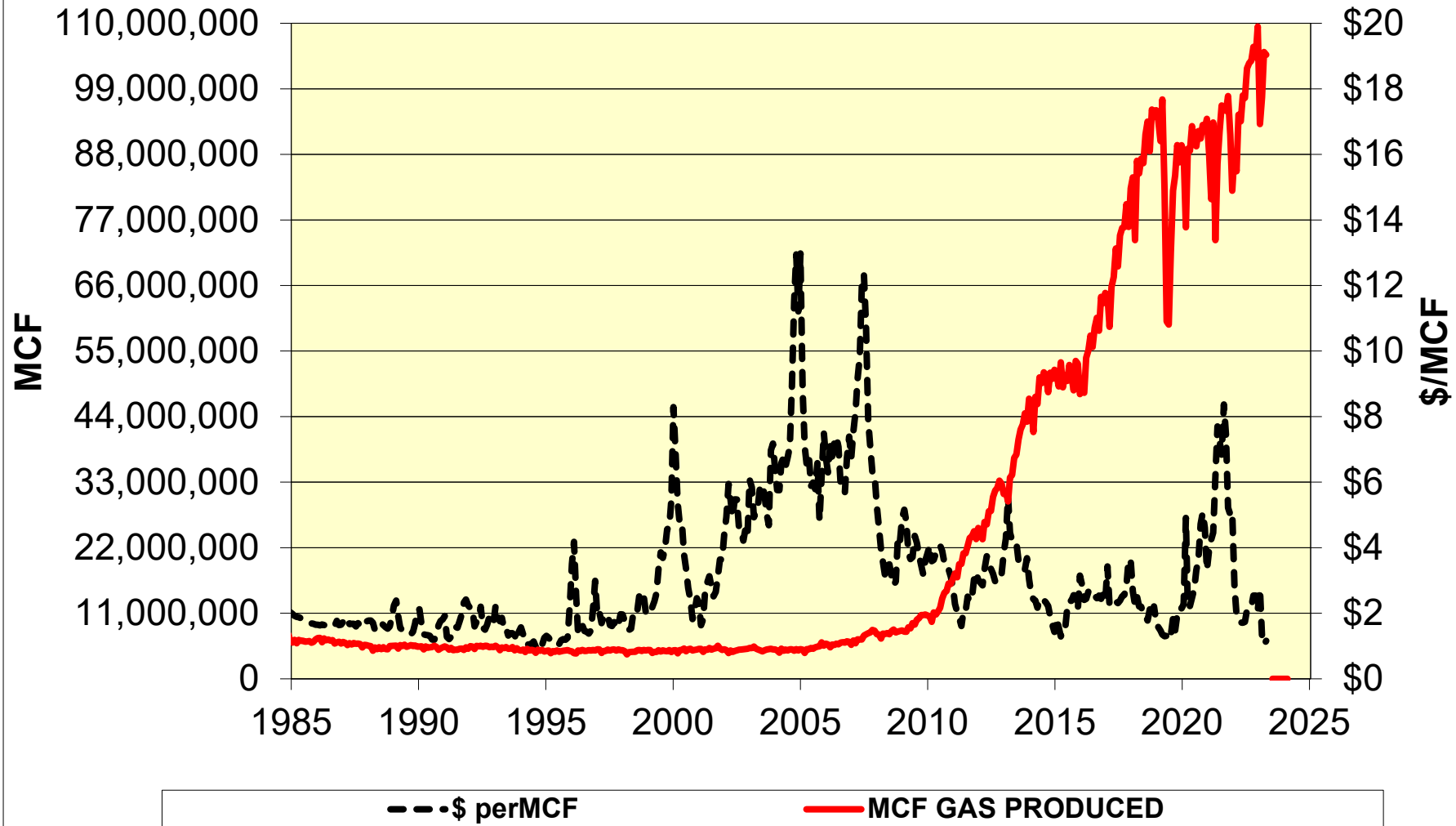


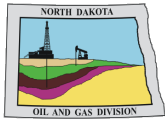
# North Dakota Daily Oil Produced and Price



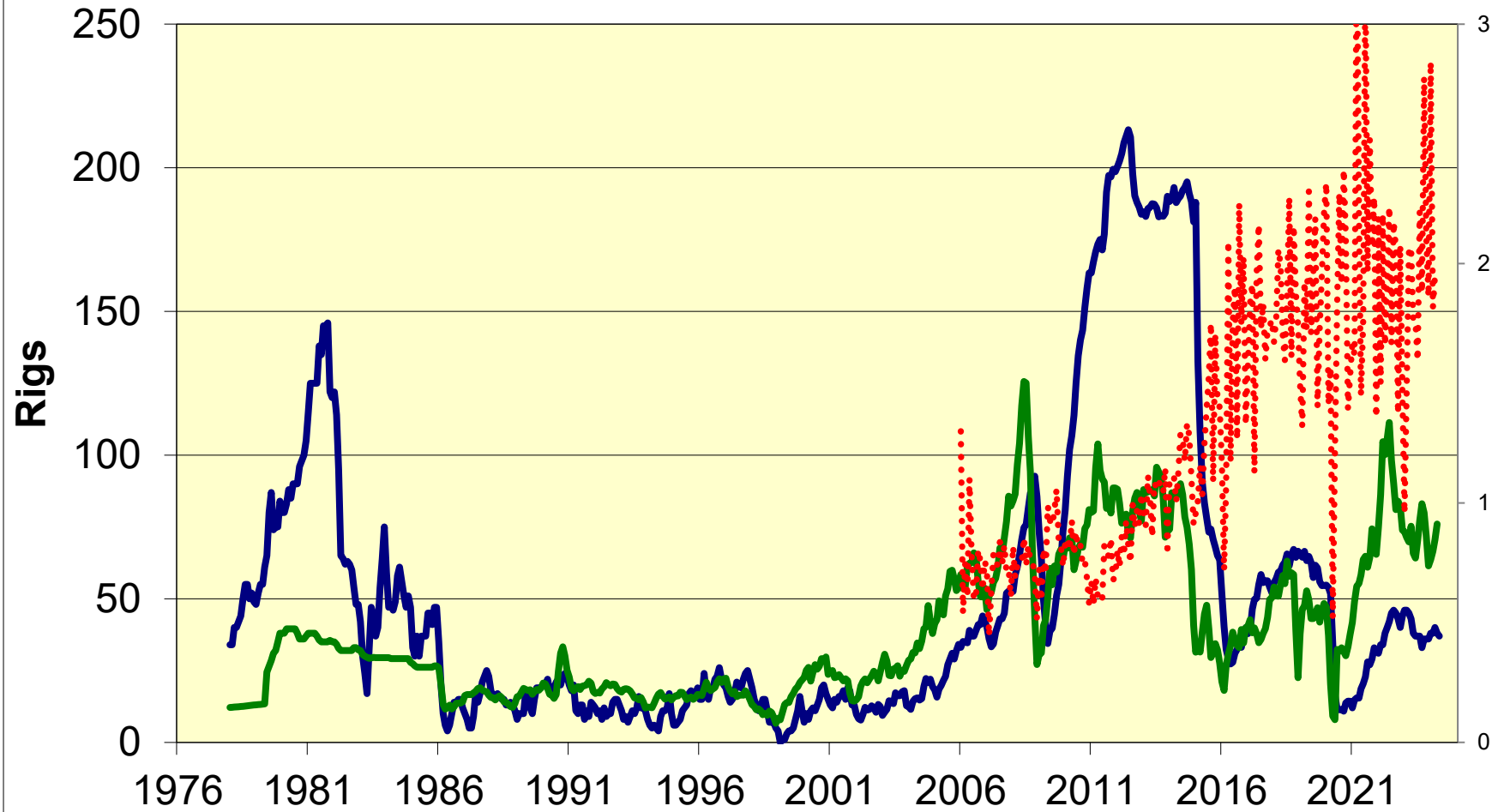


## North Dakota Monthly Gas Produced and Price



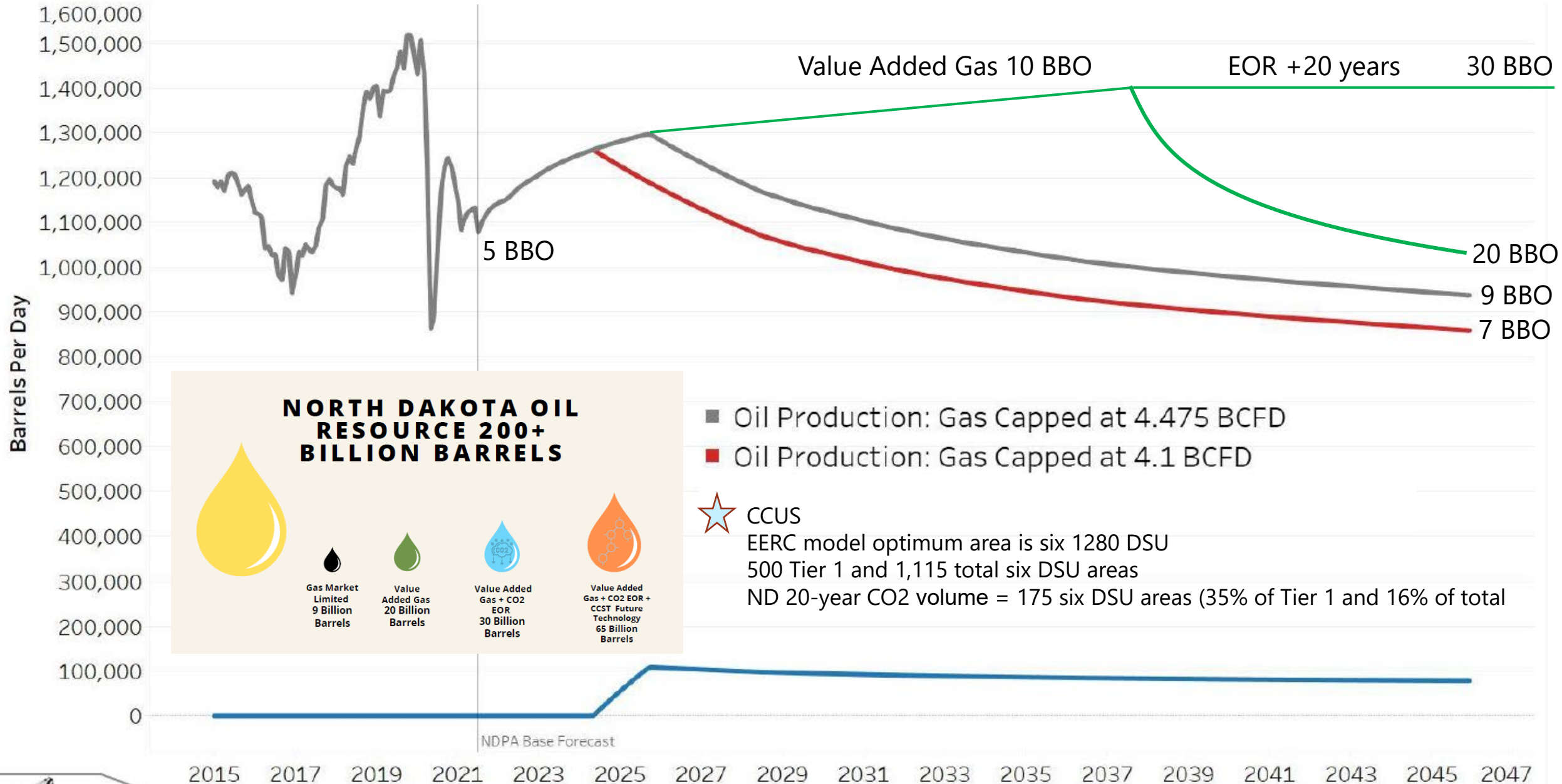


# North Dakota Average Monthly Rig Count



— Rig Count — ND Sweet Oil Price ••• Spuds / Month / Rig

# North Dakota Oil Resource Potential





**North Dakota**  
**Department of Mineral Resources**  
**[www.dmr.nd.gov](http://www.dmr.nd.gov)**

**Phone: 701.328.8020**

**Email: [oilandgasinfo@nd.gov](mailto:oilandgasinfo@nd.gov)**

**Mailing Address: 600 East Boulevard Ave. Dept 405; Bismarck, ND 58505**