

MONTANA BOARD OF OIL AND GAS CONSERVATION

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Medicine Lake

Ronald Efta
Public member/Attorney
Wibaux MT

Wayne Smith
Industry
Valier MT

Don Bradshaw
Industry
Fort Benton MT

Jack King
Industry
Billings MT

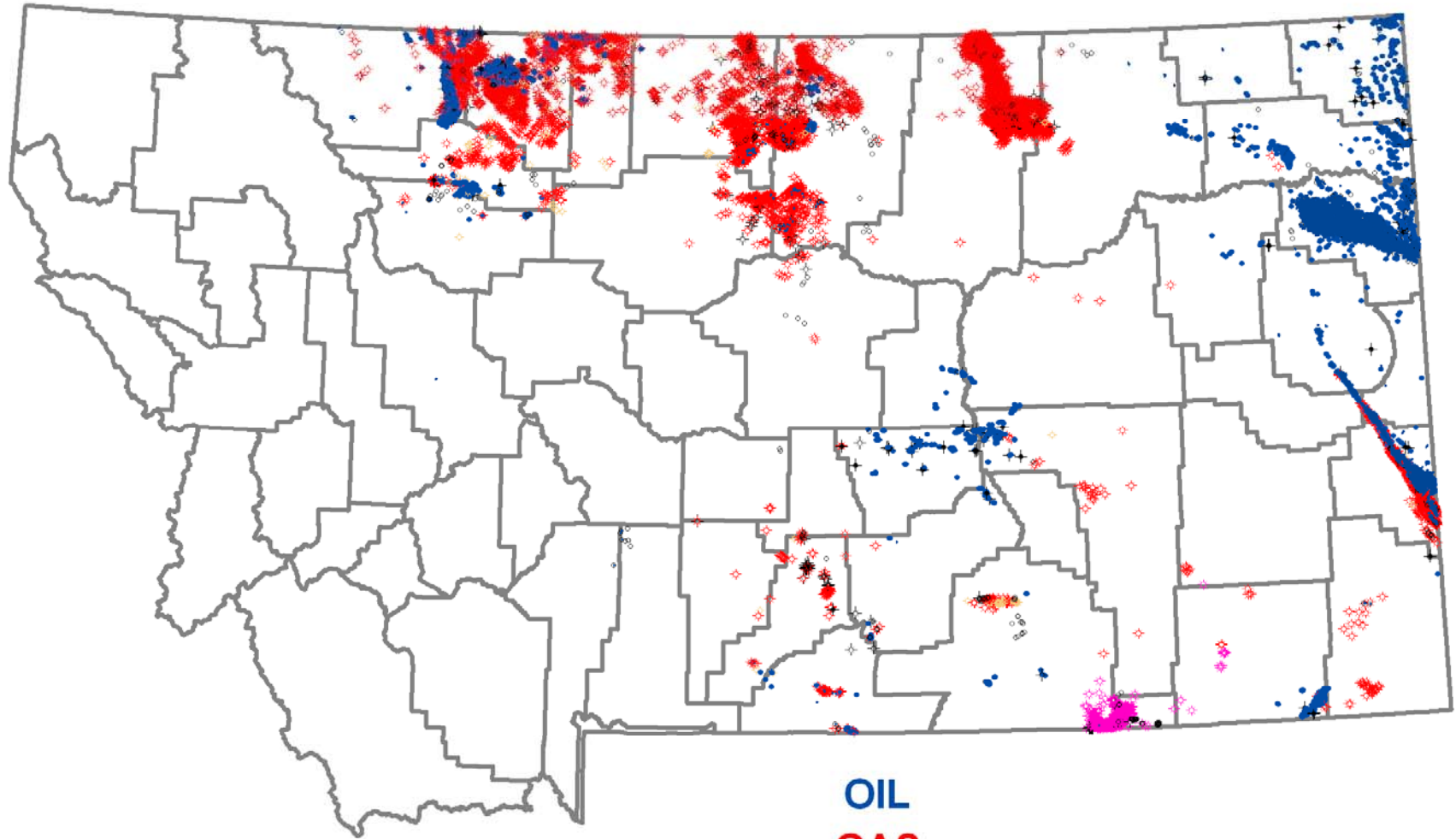
Bret Smelser
Landowner without minerals
Sidney MT

Joan Duffield
Public
Forsyth MT

**Energy and Telecommunications
Interim Committee, September 2008**



Oil and Gas Wells

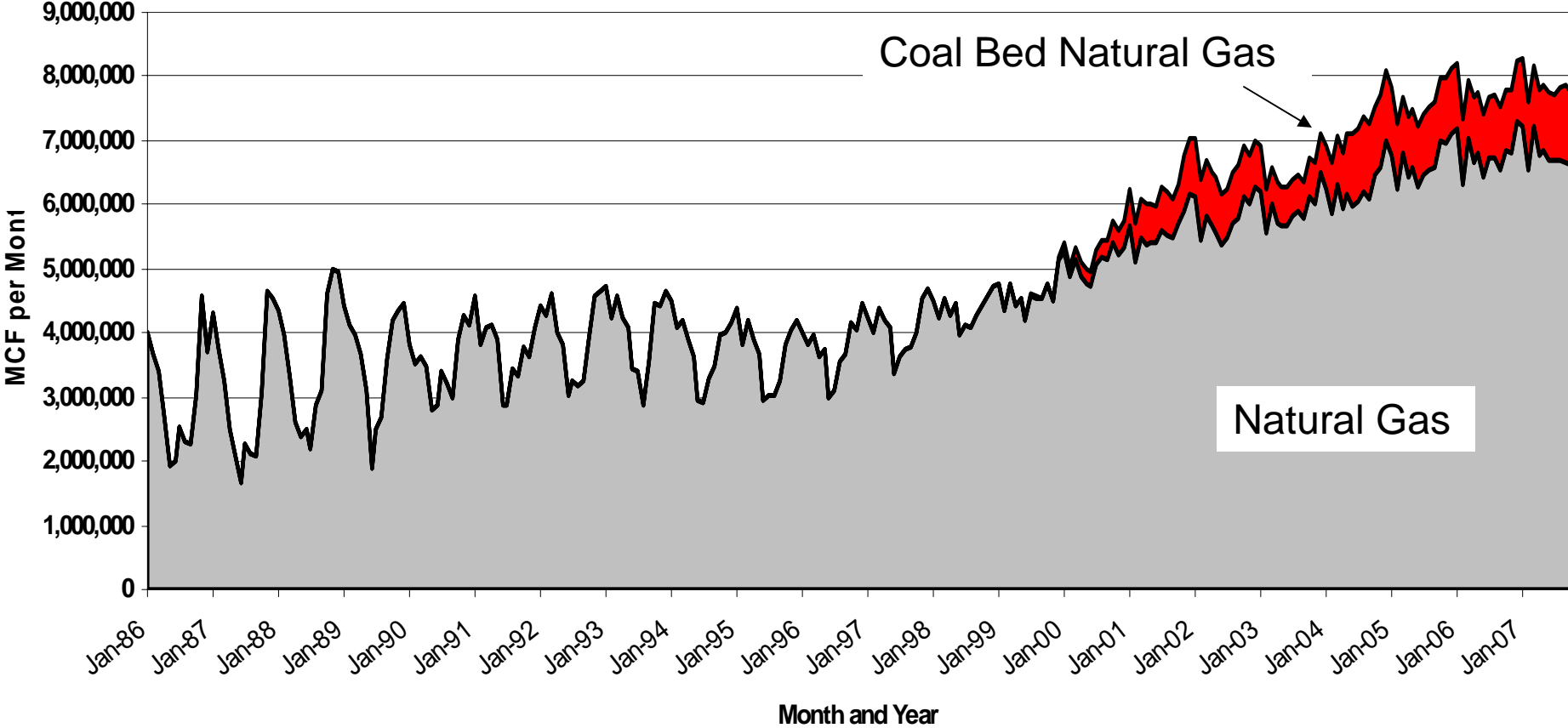


OIL

GAS

COAL BED METHANE

Monthly Natural Gas Production





Summary	Prices	Exploration & Reserves	Production	Imports/Exports & Pipelines	Storage	Consumption	Publications & Analysis
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Natural Gas Annual Supply & Disposition by State

(Million Cubic Feet)

Area: Period:

Download Series History	Definitions, Sources & Notes							
<i>Show Data By:</i>								
<input checked="" type="radio"/> Data Series	<input type="radio"/> Area	2002	2003	2004	2005	2006	2007	View History
Supply								
Dry Production		85,500	85,412	96,128	106,769	111,423		1982-2006
Interstate Receipts		58,402	56,851	44,045	42,461	74,544		1989-2006
Receipts Across U.S. Borders		787,652	767,008	763,149	728,851	696,989		1967-2006
Withdrawals from Storage		33,876	43,646	28,691	29,099	24,597	27,804	1967-2007
Disposition								
Consumption		69,532	68,473	66,829	68,355	73,882		1997-2006
Interstate Deliveries		825,205	830,437	823,702	788,048	759,932		1989-2006
Deliveries Across U.S. Borders		20,882	21,635	23,379	20,236	21,245		1967-2006
Injections into Storage		39,809	35,082	31,339	29,118	42,492	26,512	1967-2007
Balancing Item		-10,001	2,711	13,235	-1,423	-10,002		1997-2006

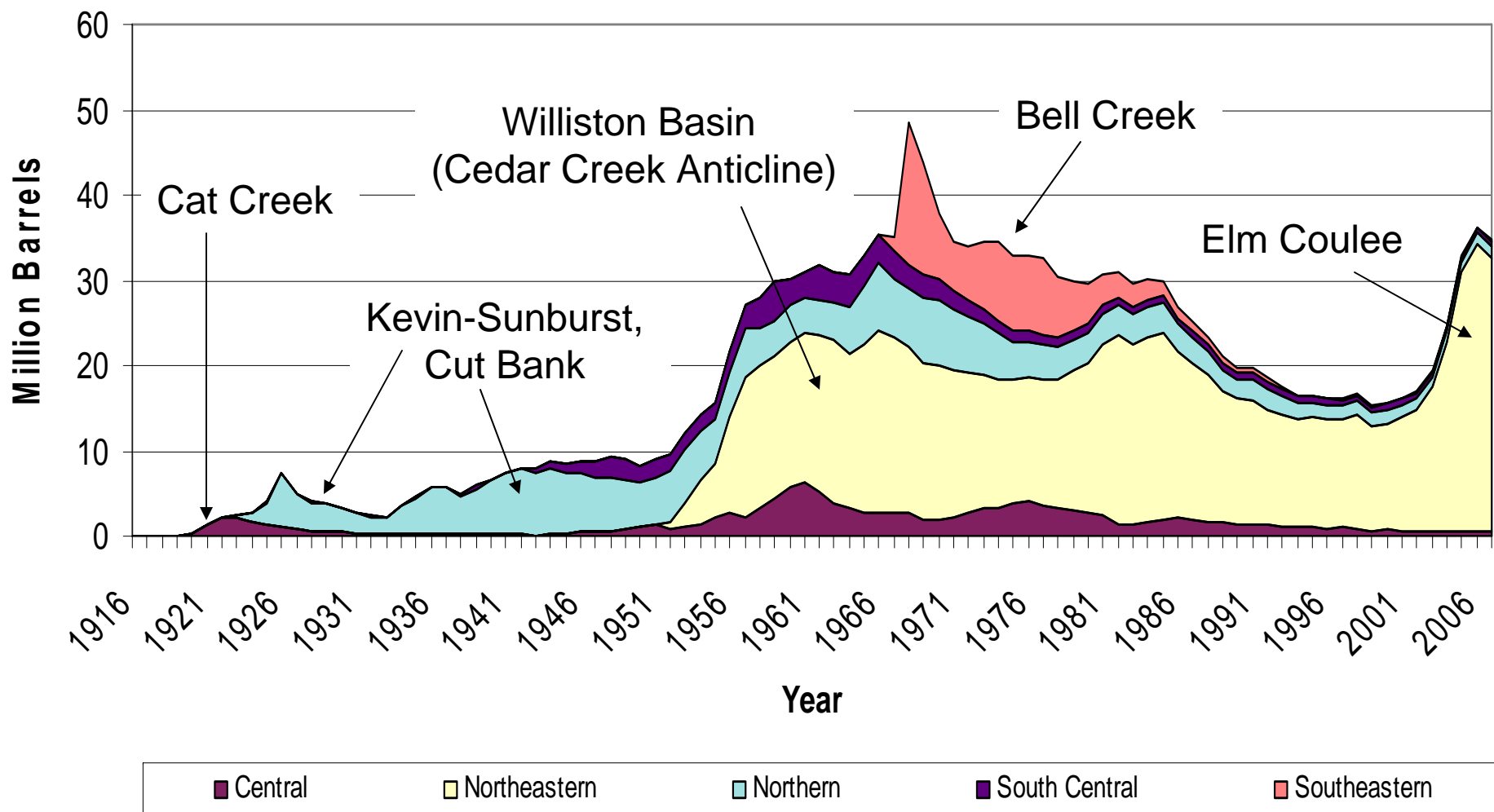
Release Date: 8/29/2008

Next Release Date: 9/30/2008

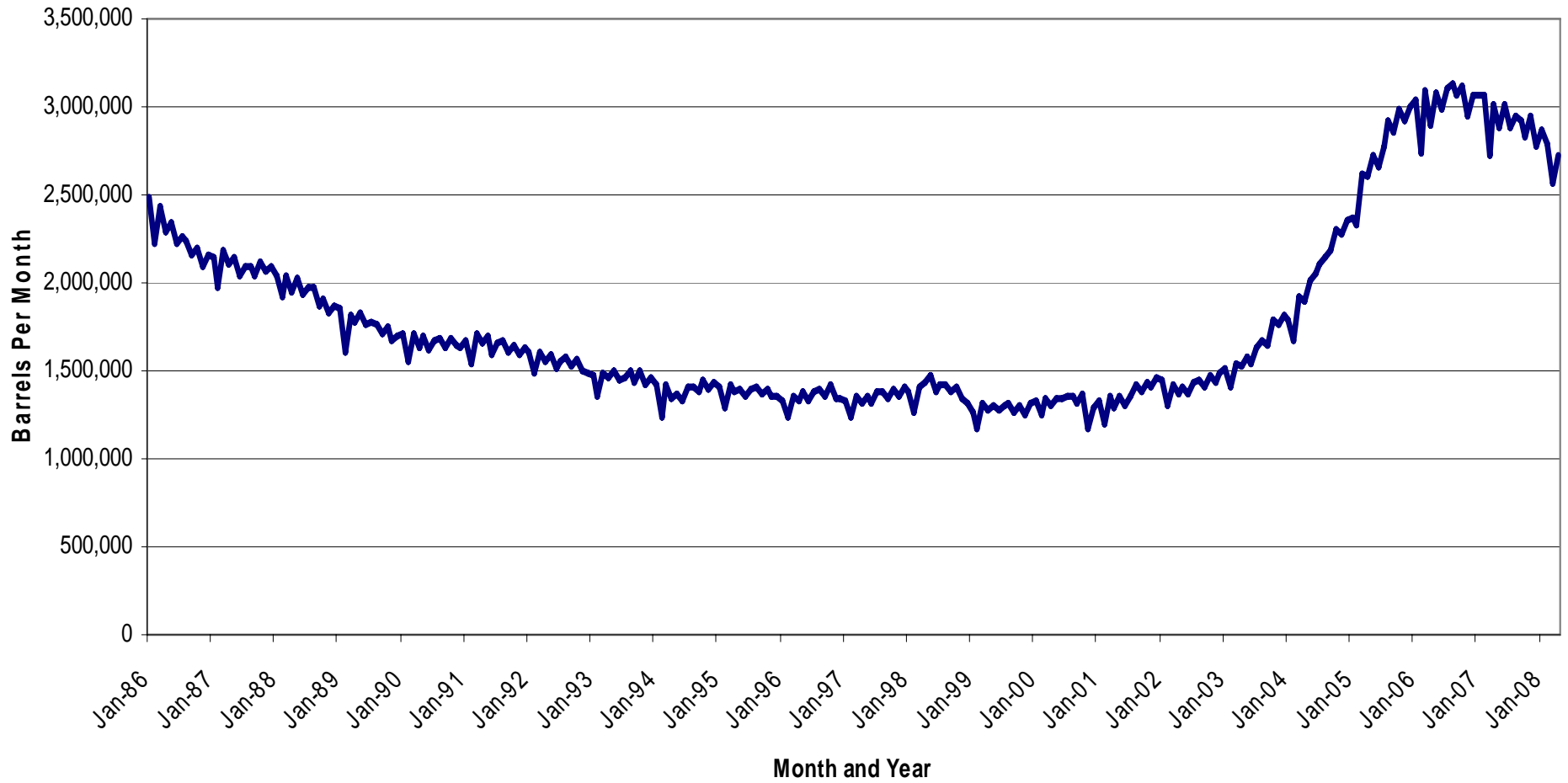
- = No Data Reported; **NA** = Not Available; **W** = Withheld to avoid disclosure of individual company data.

Notes: Balancing item volumes are equal to total disposition minus total supply. See Definitions, Sources, and Notes link above for more information on this table.

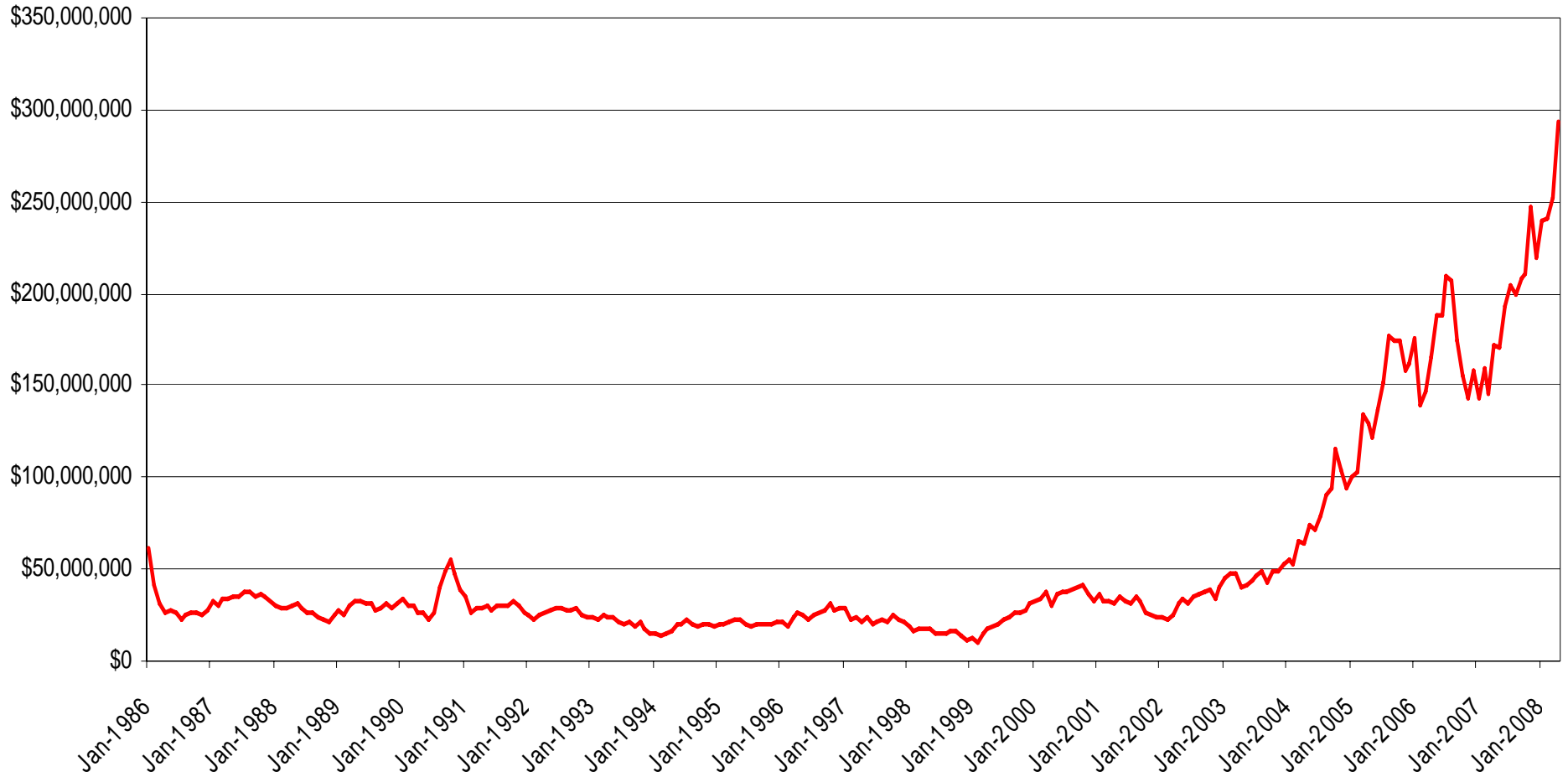
Annual Oil Production, 1916 through 2007



Montana Oil Production, 1986 through April 2008



Estimated Monthly Value of Oil Produced Based Upon EIA Reported First-Purchaser Price for Montana



2006 Refiners' Annual Report

Summary

Company	Beginning Storage	Montana Oil	Wyoming Oil	Canada Oil	Refined	Ending Storage
Cenex	192,377	1,113,647	803,508	19,762,607	21,811,565	260,574
Conoco	135,962	112,470	273,267	20,838,356	21,196,330	163,725
Exxon Corp.	240,569	0	7,549,617	10,310,296	17,955,240	145,242
Montana Refining	10,934	3,237	0	3,131,724	3,133,970	11,925
Total	579,842	1,229,354	8,626,392	54,042,983	63,897,105	581,466

Percentage Of Crude Oil Received

Year	Montana	Wyoming	Canada
2002	2.84	18.21	78.95
2003	2.23	15.96	81.81
2004	1.97	16.00	83.03
2005	2.18	14.80	83.02
2006	1.92	13.50	84.58

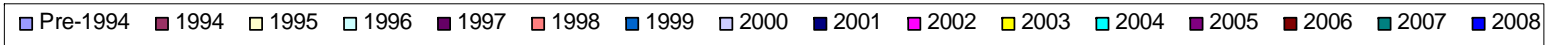
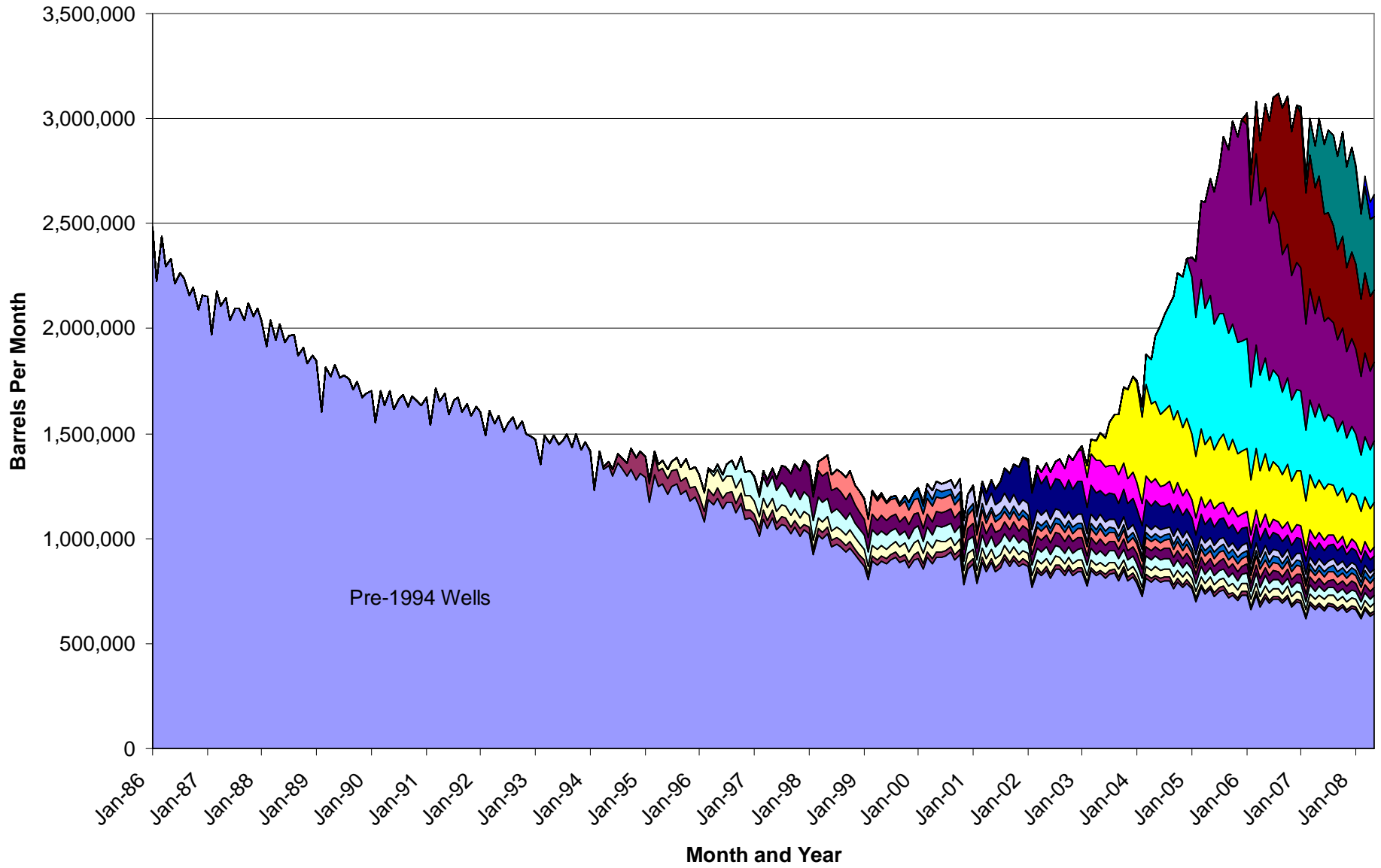
Average Barrels Per Day

Year	Montana	Wyoming	Canada	Total
2002	4,749	30,411	131,863	167,023
2003	3,648	26,163	134,128	163,939
2004	3,447	26,234	145,214	174,895
2005	3,774	25,678	143,959	173,389
2006	3,368	23,634	148,063	175,061

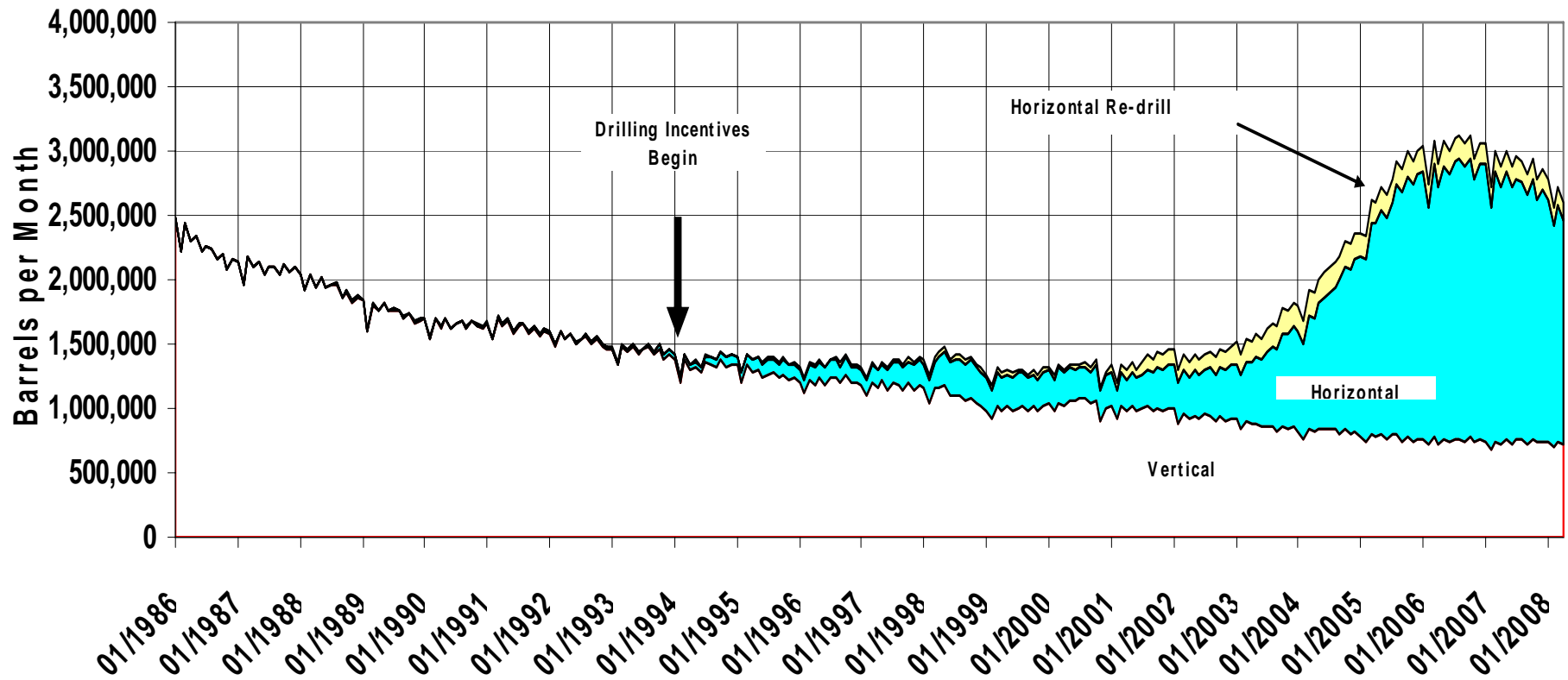
Refining Five Year Comparison (Barrels)

2002	2003	2004	2005	2006
61,048,692	59,958,255	63,781,829	63,286,985	63,897,105

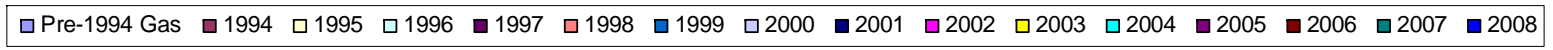
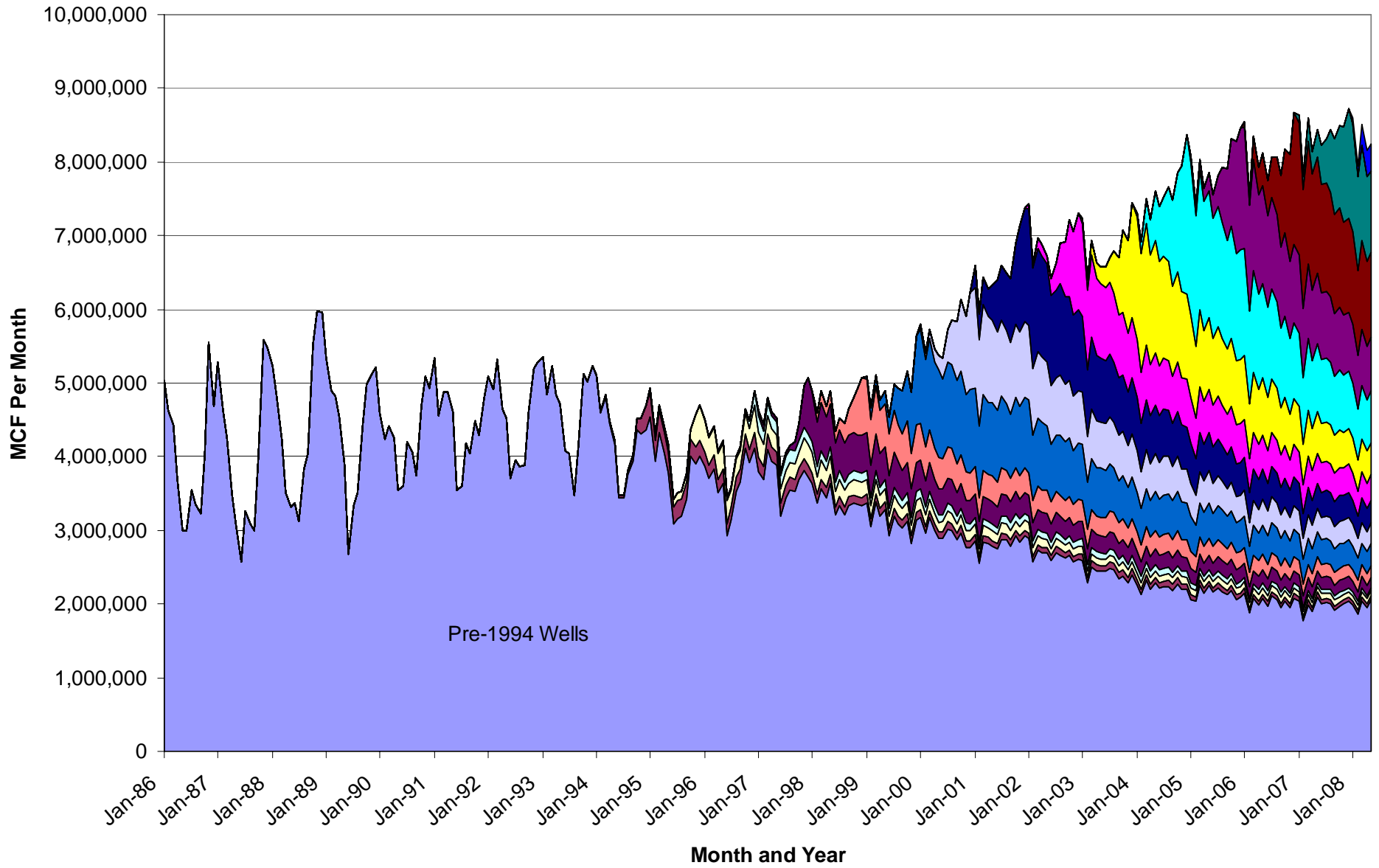
Monthly Oil Production with Well Completion Year Identified (1994 and Later)



Montana Monthly Oil Production, Vertical vs. Horizontal Wells January 1986 through April 2008



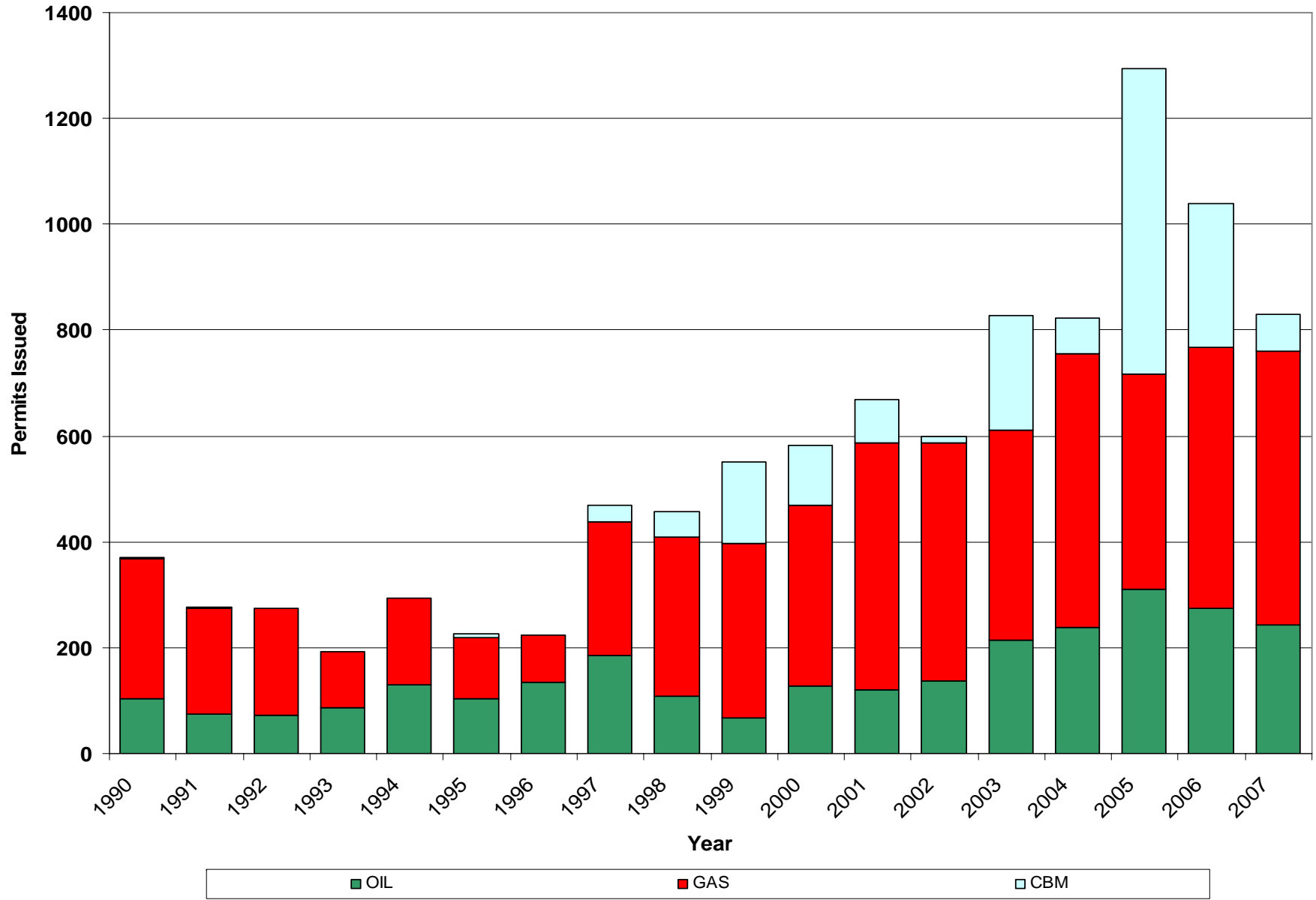
Monthly Gas Production with Well Completion Year Identified (1994 and Later)



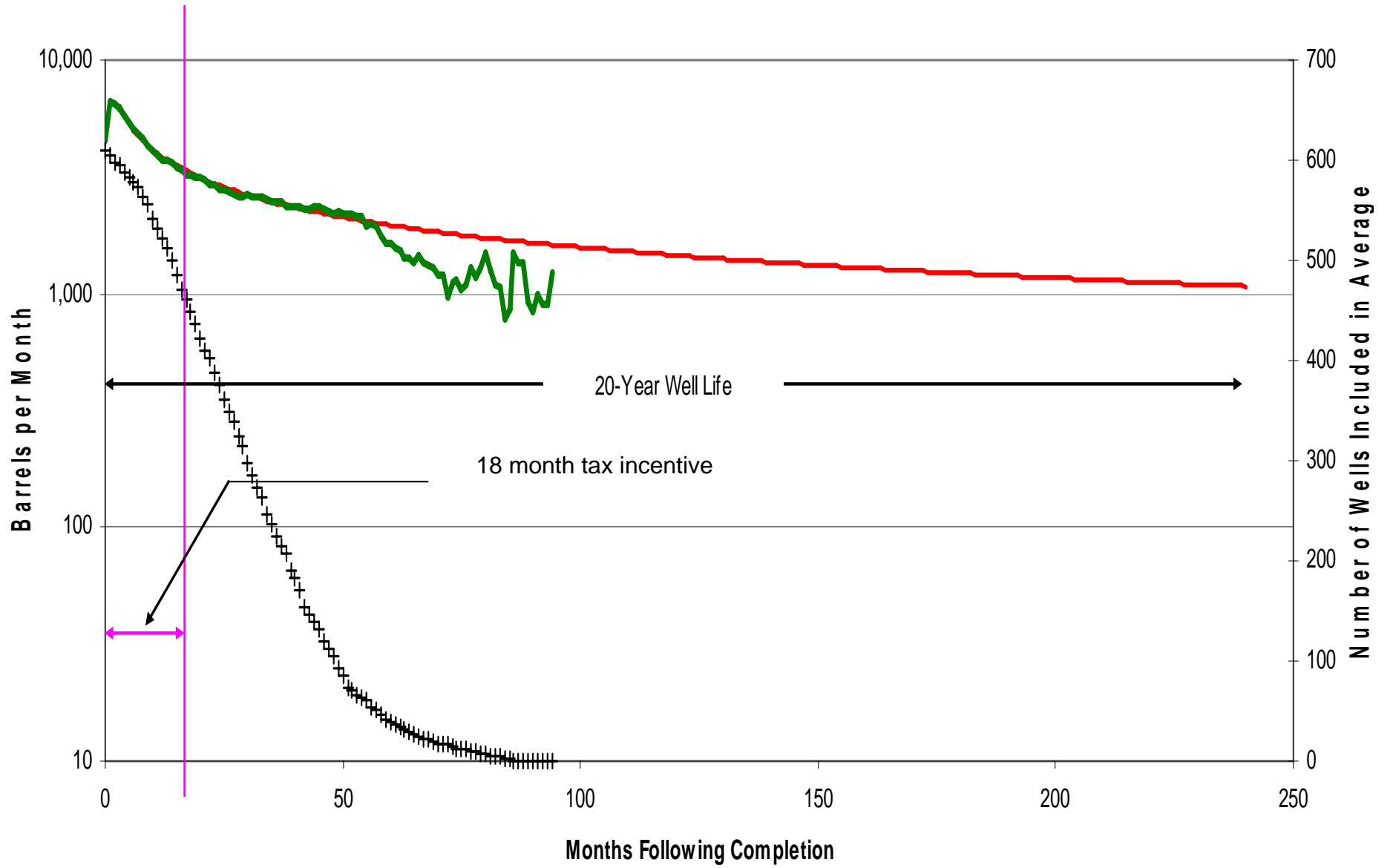
Production Summary

- Montana oil production peaked during 2006 with approximately 36 million barrels of oil produced during the year.
- This was up from a recent historical low of approximately 15 million barrels of oil produced during 1999.
- Over 50% of the 2006 oil production was from the Bakken Formation in Elm Coulee Field.
- Elm Coulee Field has produced 71.5 million barrels of oil since its discovery in 2000.
- Statewide production has declined at a rate of approximately 6% per year since mid-2006.
- Gas production has shown a steady increase by in-fill and new field development.

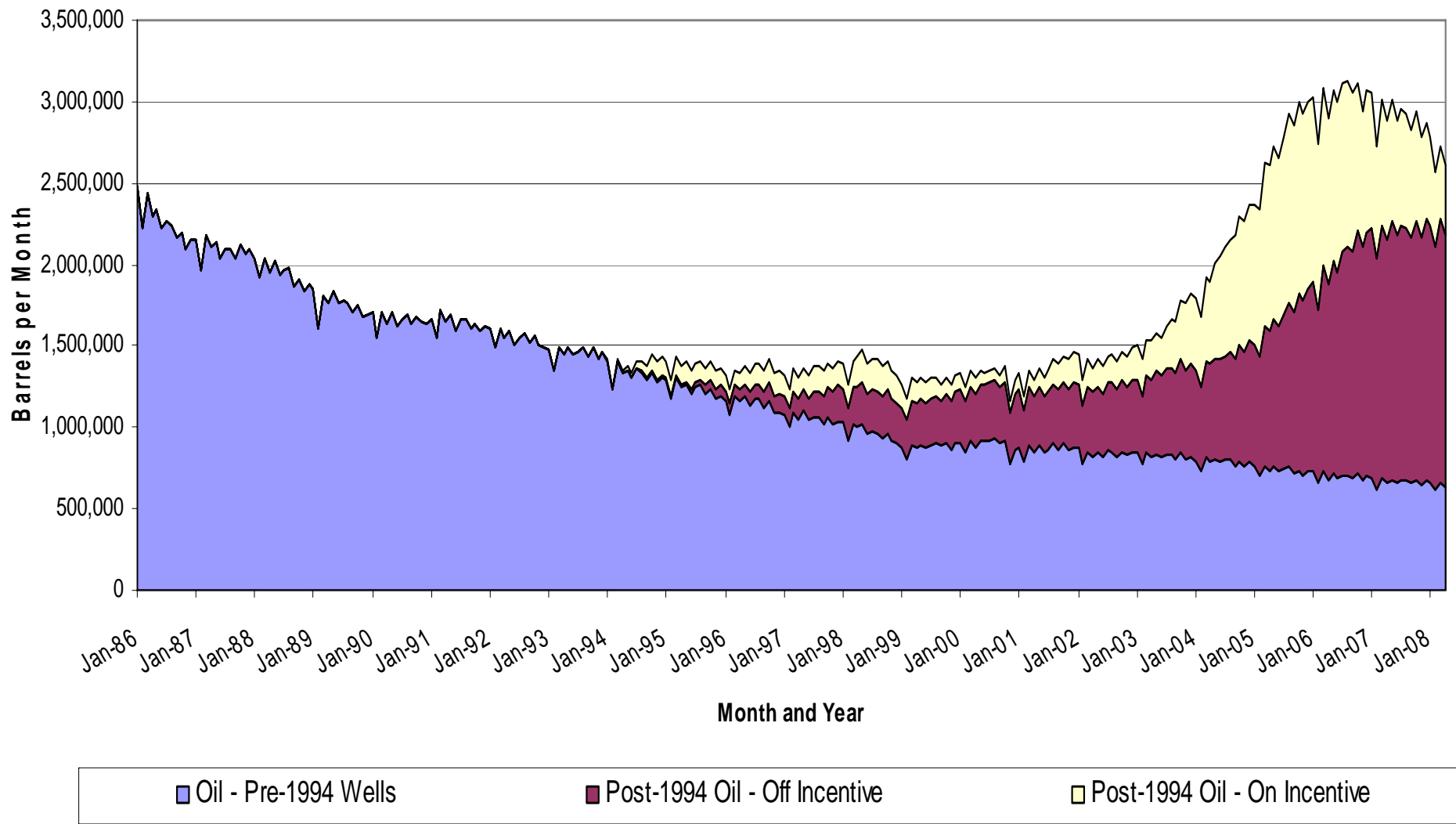
Drilling Permits Issued, by Year



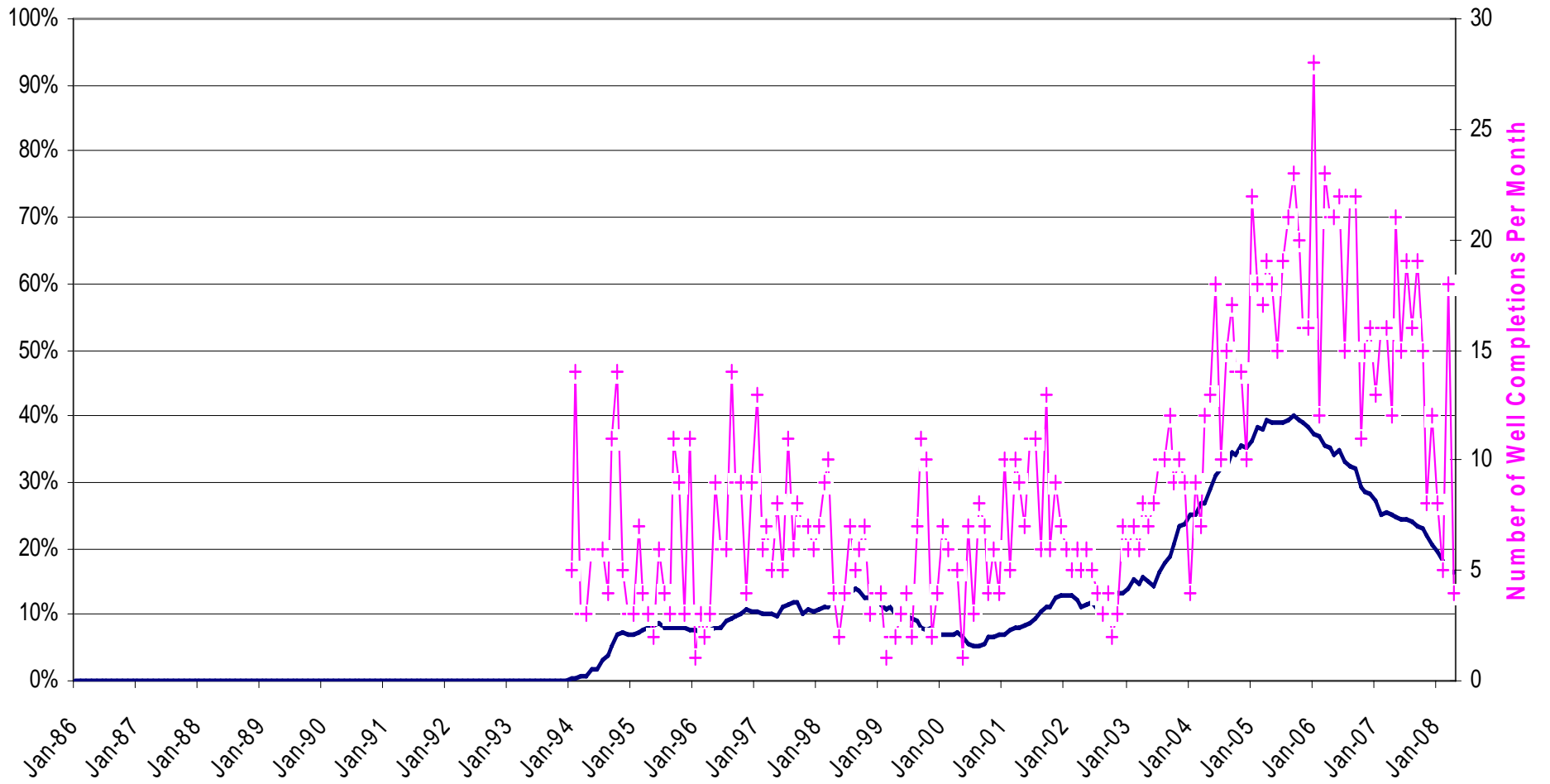
Normalized Monthly Bakken Formation Production



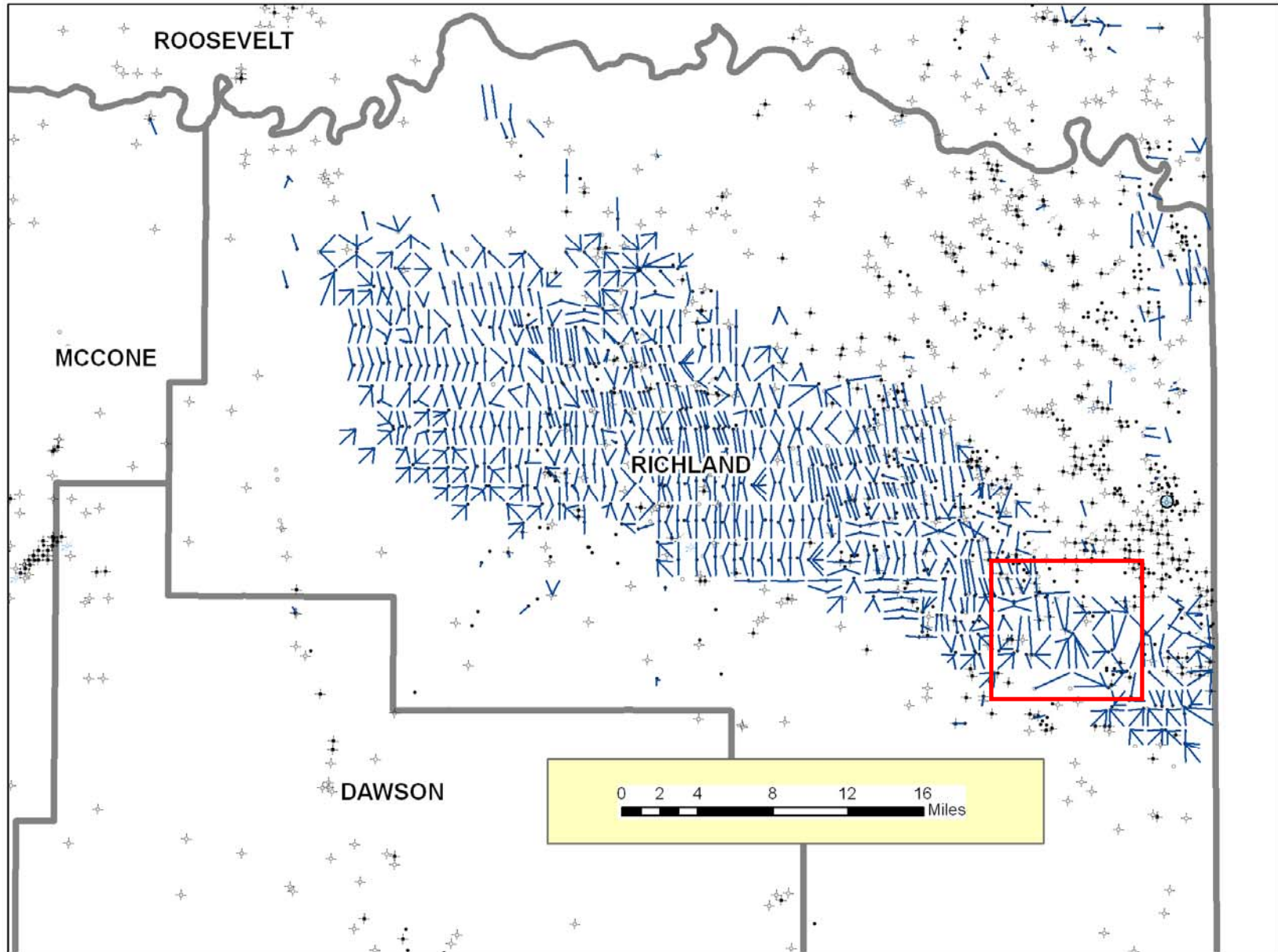
**Total Monthly Oil Production Showing Volume Subject to Incentive
(85% Working Interest Assumed)**



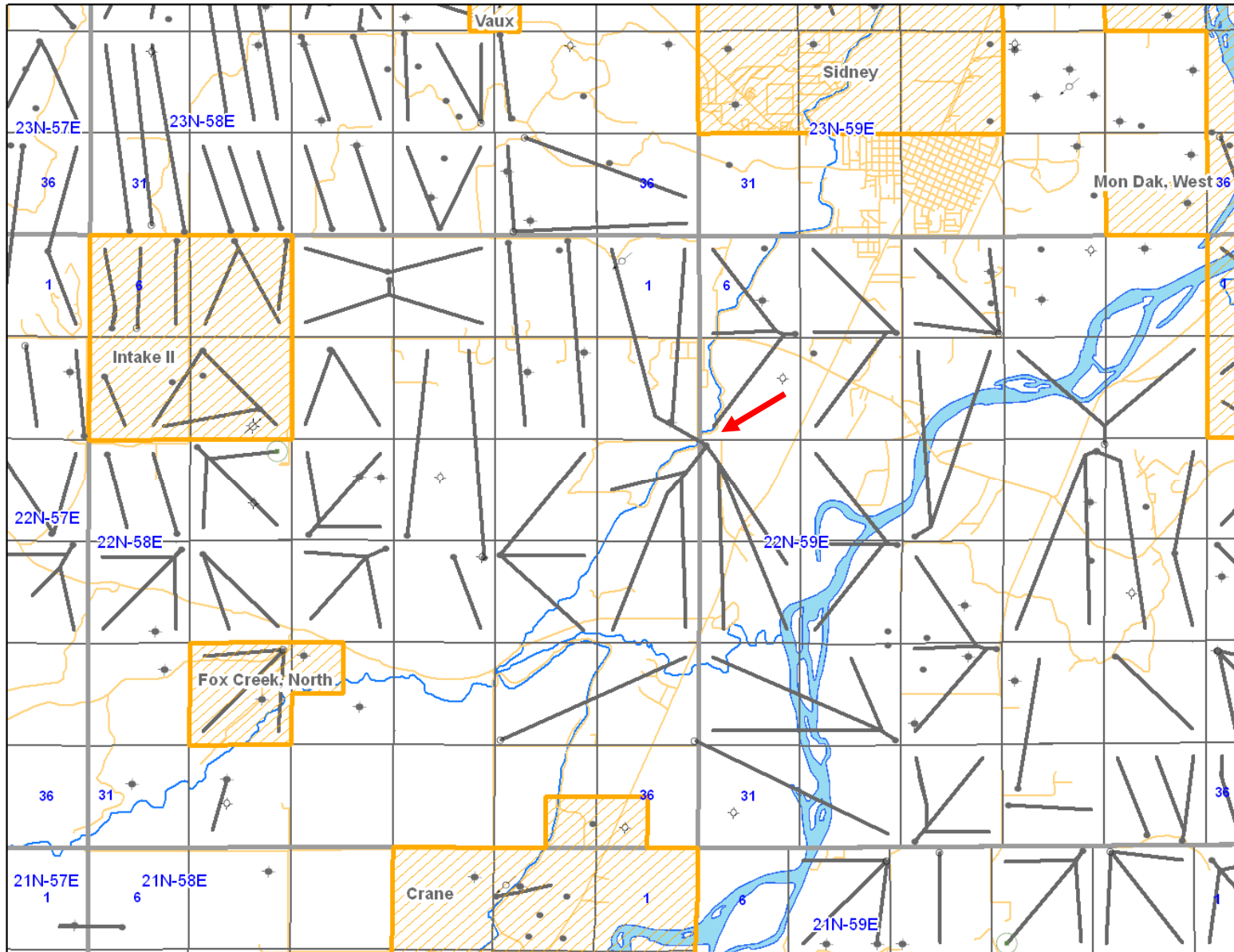
Barrels Under New -Well Incentive as Per Cent of Total Monthly Production



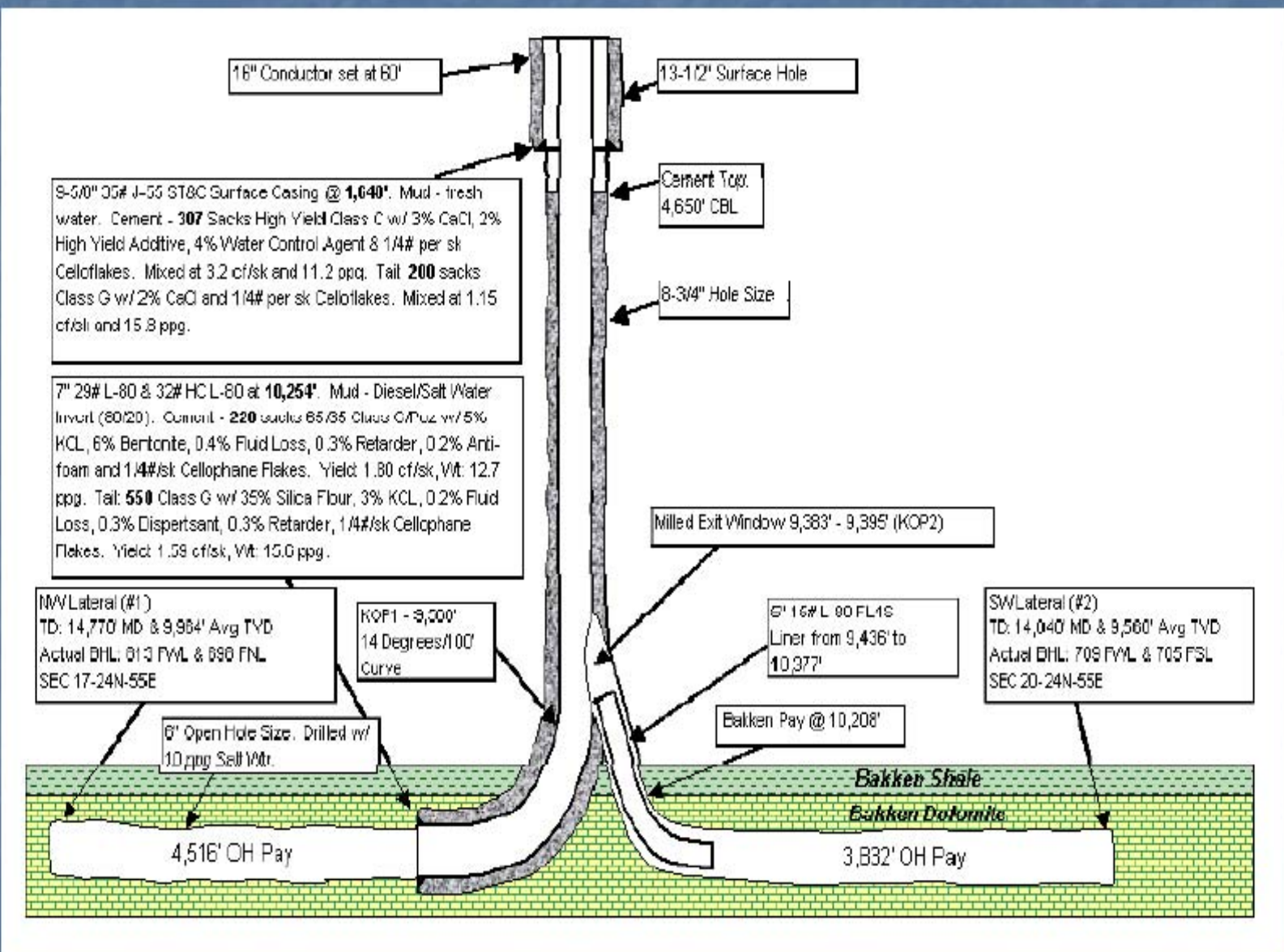
Elm Coulee Field, Richland County



Development Near Sidney



VERTICAL CASING EXIT



Horizontal Well Vertical Exit

WELL CONSTRUCTION PLAN HORIZONTAL CASING EXIT

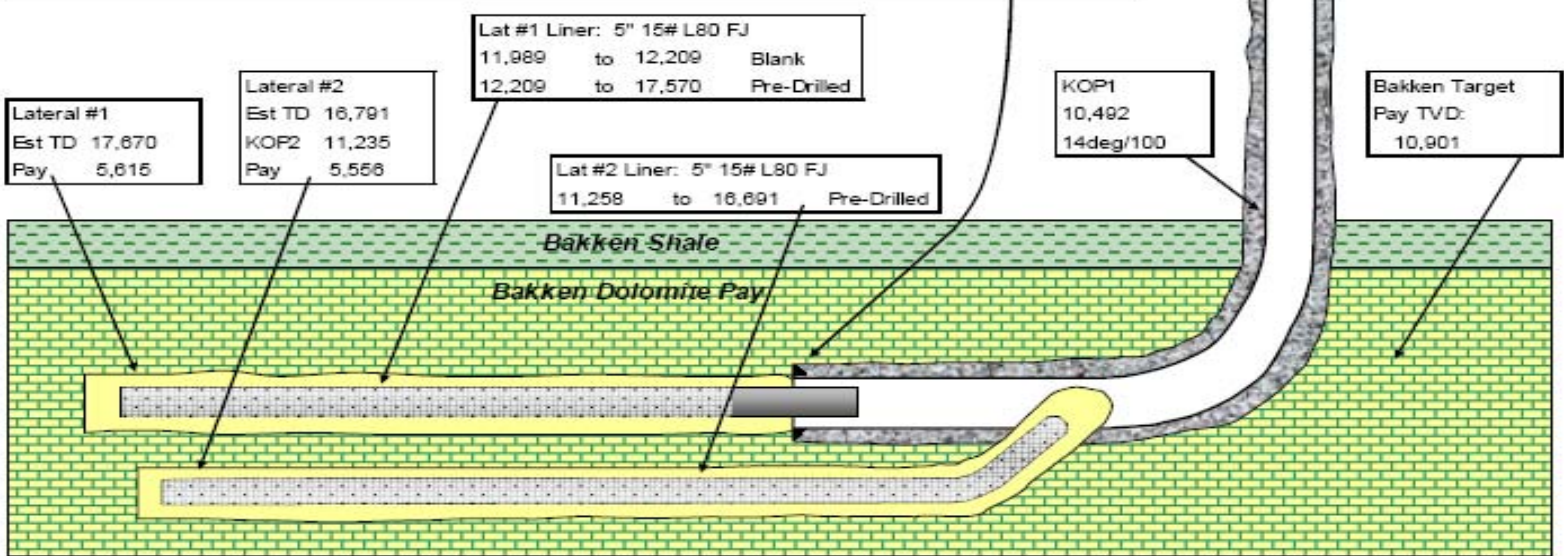
**Headington Oil Co, LP
Dual Lateral Coplanar
Well Construction Diagram**

Evoniuk 44X-17
Location: SE SE Sec 17 T142N R99W
Footage: est. 500 FEL & 500 FSL
Elev: est. Graded Pad 2640, KB 2661
Billings County, MT

Directions to Well: 15 miles N of Belfield, ND on Highway 85 to Club 85, then 3 mile W on CR, then 1 mile S, then 1 mile E.

16" Conductor set at 60' - 80'. Drill out w/ 13.5" bit.
Set 9-5/8" 36# K-55 surface casing at 2,200
Lead Cement: 504 Sacks SanJel - Control Set C plus 0.25% CFL-3, 1% OGC-60 and 1/4 #/sk Celloflake. Mixed at 18.95 gpc w tr, 2.85 cf/sk yield and 11.2 ppg.
Tail Cement: 200 Sacks Class G plus 2% CaCl₂ and 1/4 #/sk Celloflake. Mixed at 5.0 gpc w tr, 1.15 cf/sk yield and 15.8 ppg. Volume calculated using 55% excess.

8-3/4" hole size. Drilled with invert mud (80% diesel & 20% SW)
7" Casing set at: 12,055
Lead Cement (top at 5,100) - 202 Sacks 65/35 Class G/Poz w/ 5% KCL, 6% Bentonite, 0.4% Fluid Loss, 0.3% Retarder 0.2% Anti-foam and 1/4#/sk Cellophane Flakes. Yield: 1.80 cf/sk, Wt: 12.7 ppg.
Tail Cement (top at 6,700) - 764 Sacks Class G w/ 35% Silica Flour, 3% KCL, 0.2% Fluid Loss, 0.3% Dispersant, 0.3% Retarder, 1/4#/sk Cellophane Flakes. Yield: 1.59 cf/sk, Wt: 16.6 ppg.
Assume 9" hole plus 30% excess.



Fracture Treatment Equipment



TYPICAL HORIZONTAL FRACTURE STIMULATION (\$350,000 to \$650,000)

PER LATERAL, in open hole or uncemented pre-perfed liner hole:

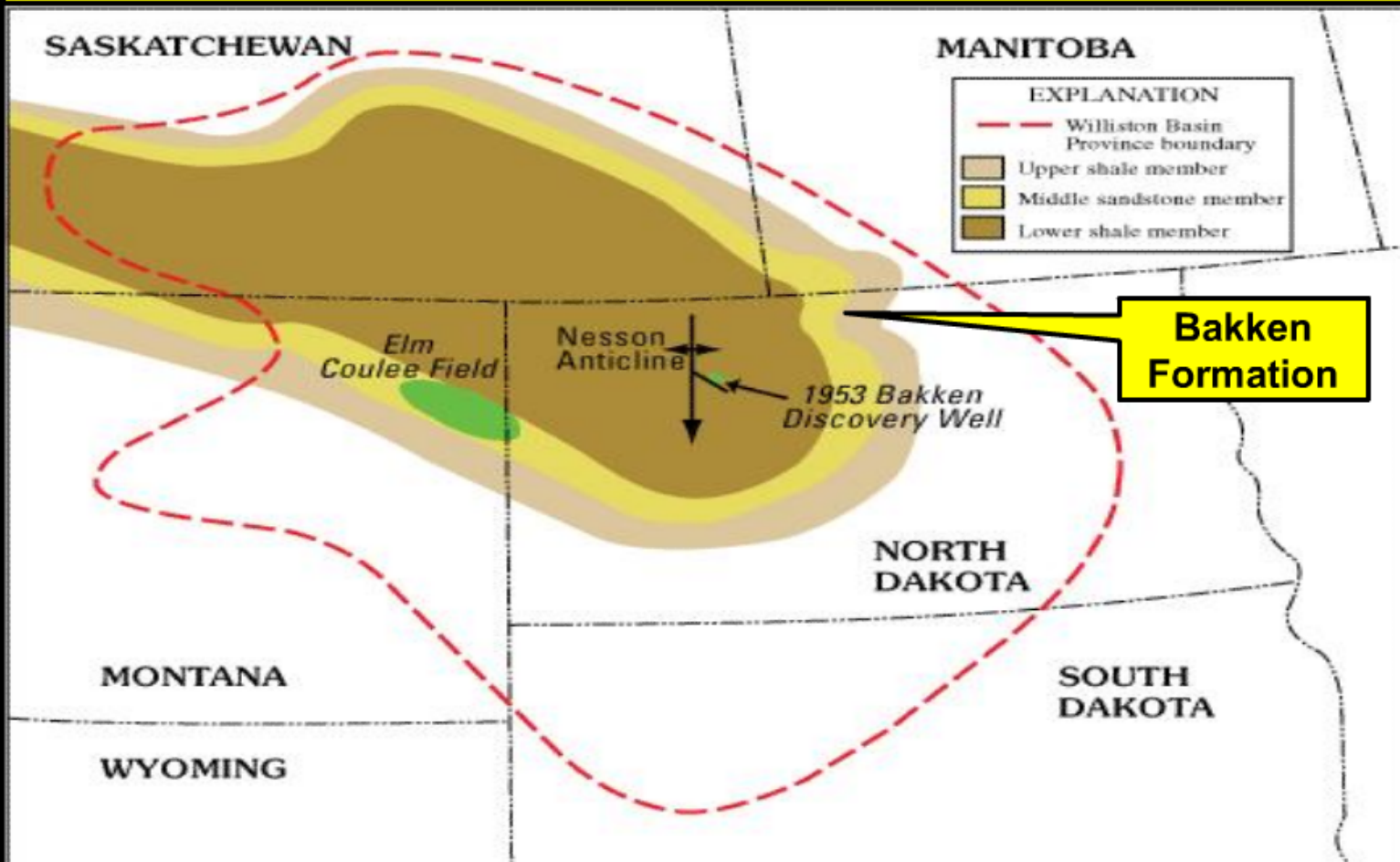
“Gelled water-sand frac” in several stages

**Sand concentration from 1 to 4+ pounds of sand per gallon (20-40
mesh sand, to ~100#/ft of hole)
w/ additives, surfactants**

**Pumped at a rate of 70-100 BPM, (In 5,000' lateral, Total of ~5,000 bbls
gelled water and 400,000# sand)**

Bakken Formation, U.S. Williston Basin

The Bakken Formation was deposited in the more central and deeper portion of the Williston Basin, Montana and North Dakota



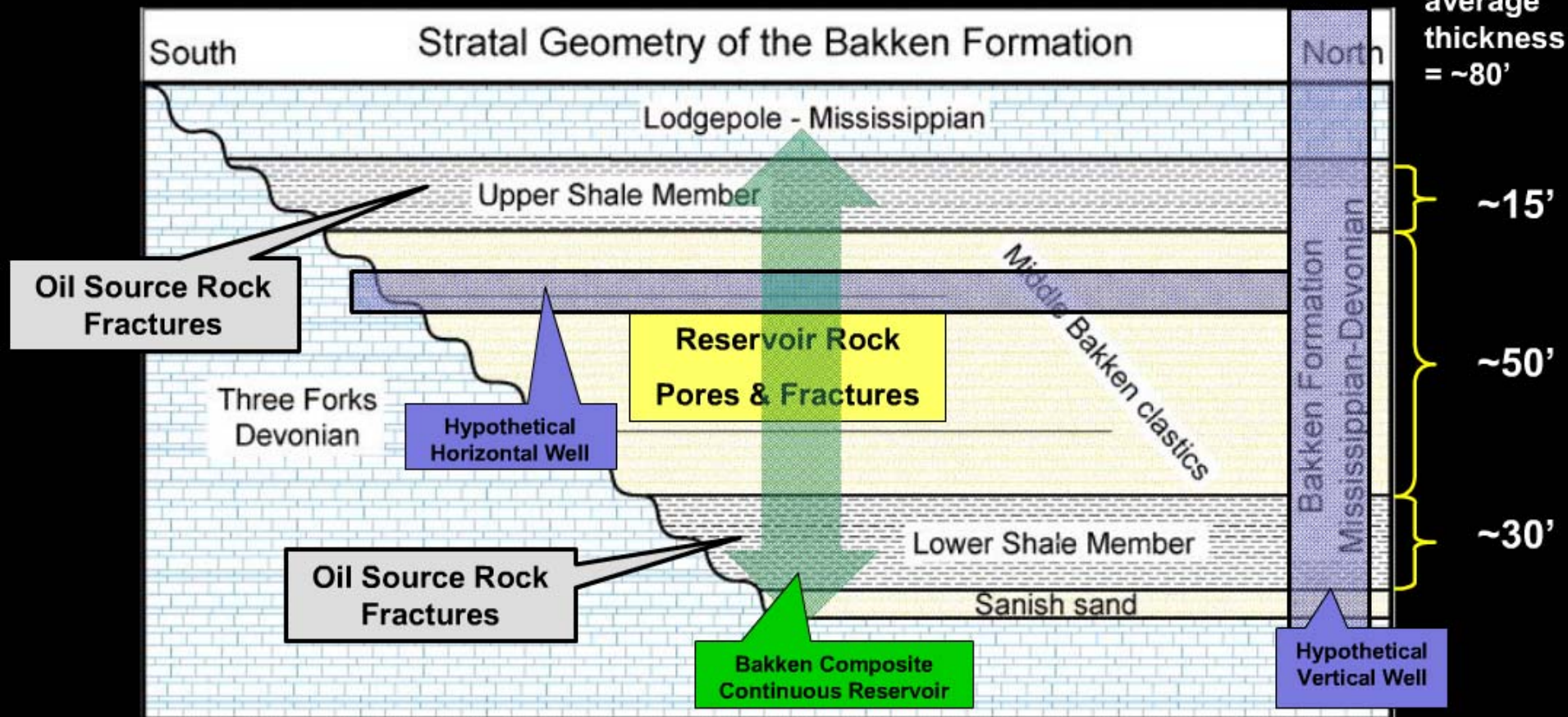
Each succeeding member of the Bakken Formation is of greater areal extent.

Modified from Walker and others (2006)

Bakken Formation

Stratigraphic Cross Section Relations

Average production depth = 9,000-10,000'

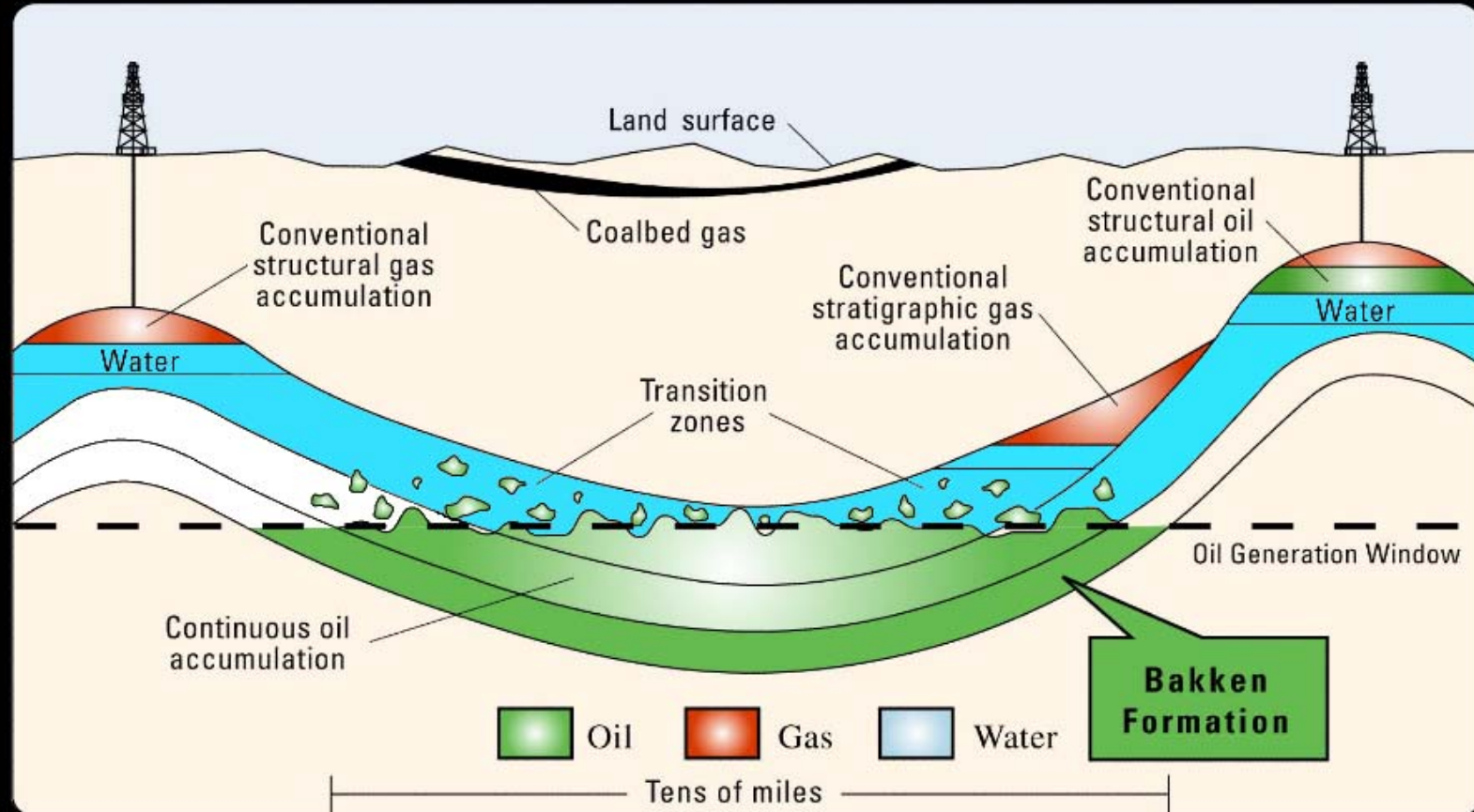


Bakken Formation is only in the subsurface and consists of three members, which comprise the Bakken composite continuous reservoir.

Modified from LeFever (2006)

Conventional vs Continuous Resources

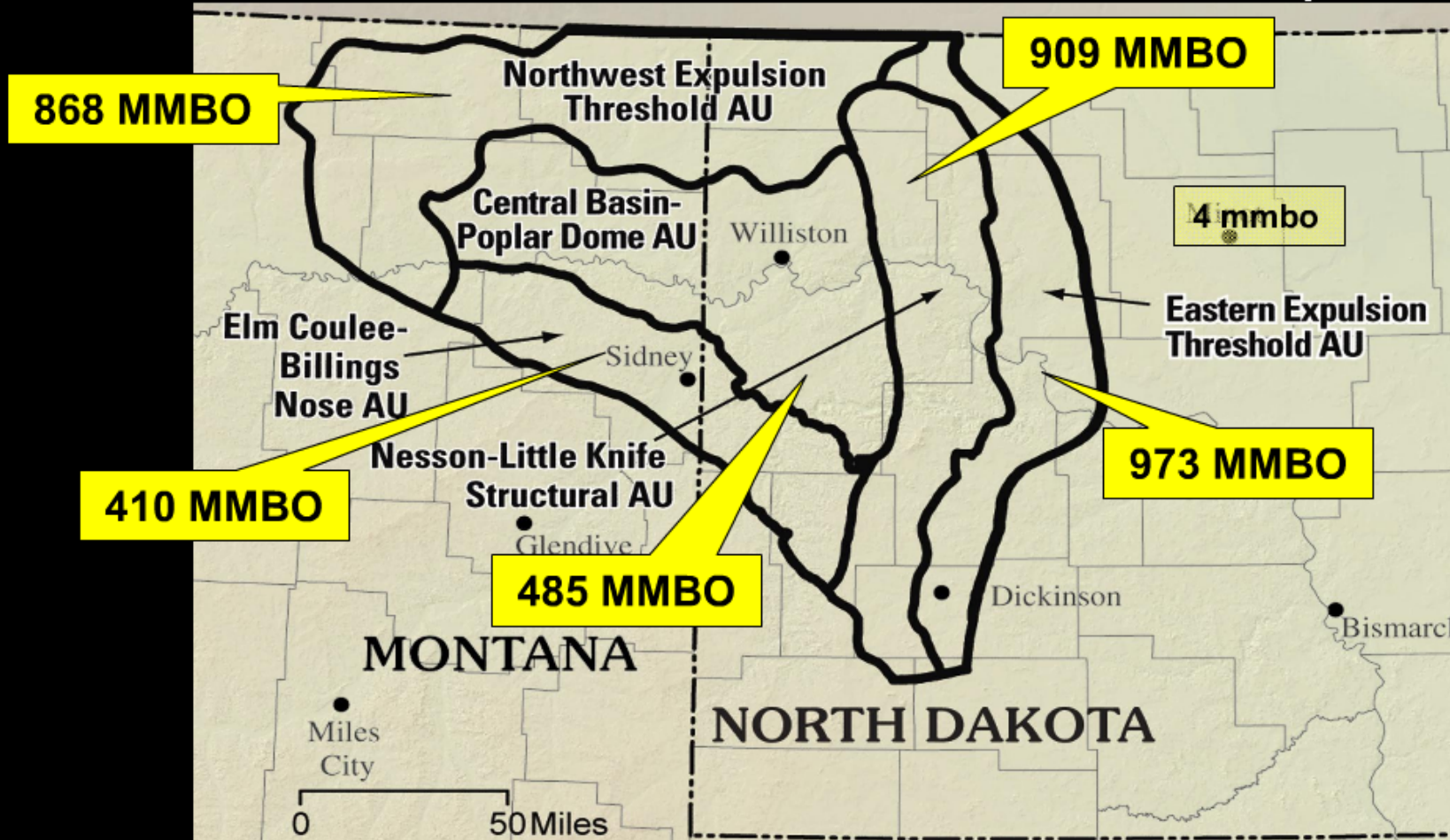
Continuous Shale Accumulations



REQUIREMENT... the shale is now, or was at sometime in its history, within the oil or gas generation window

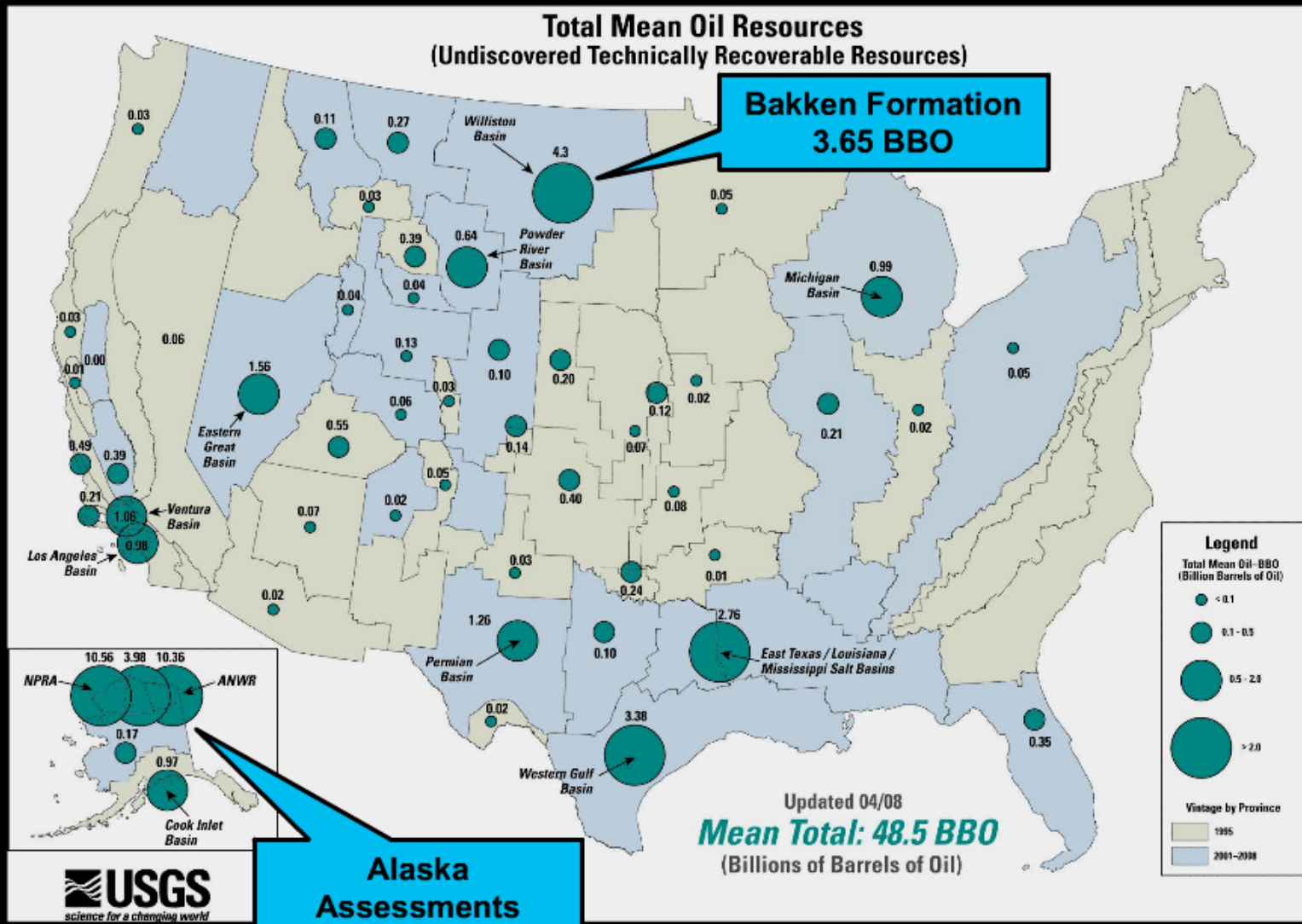
Bakken Formation Assessment Results per Assessment Unit

Mean Volume in Millions of Barrels of Oil (MMBO)



TOTAL 3.65 BBO (F95=3.0 BBO; F5=4.3 BBO)

The Bakken Formation is the Largest Oil Accumulation Assessed by USGS in the Lower 48





Questions?

www.bogc.dnrc.mt.gov