

North Dakota Asphalt Conference

April 6, 2010

Oil Production Impact on Roads

Jack Olson
Planning & Programming Division
NDDOT



Thank you to

Lynn Helms, Dave Hvinden

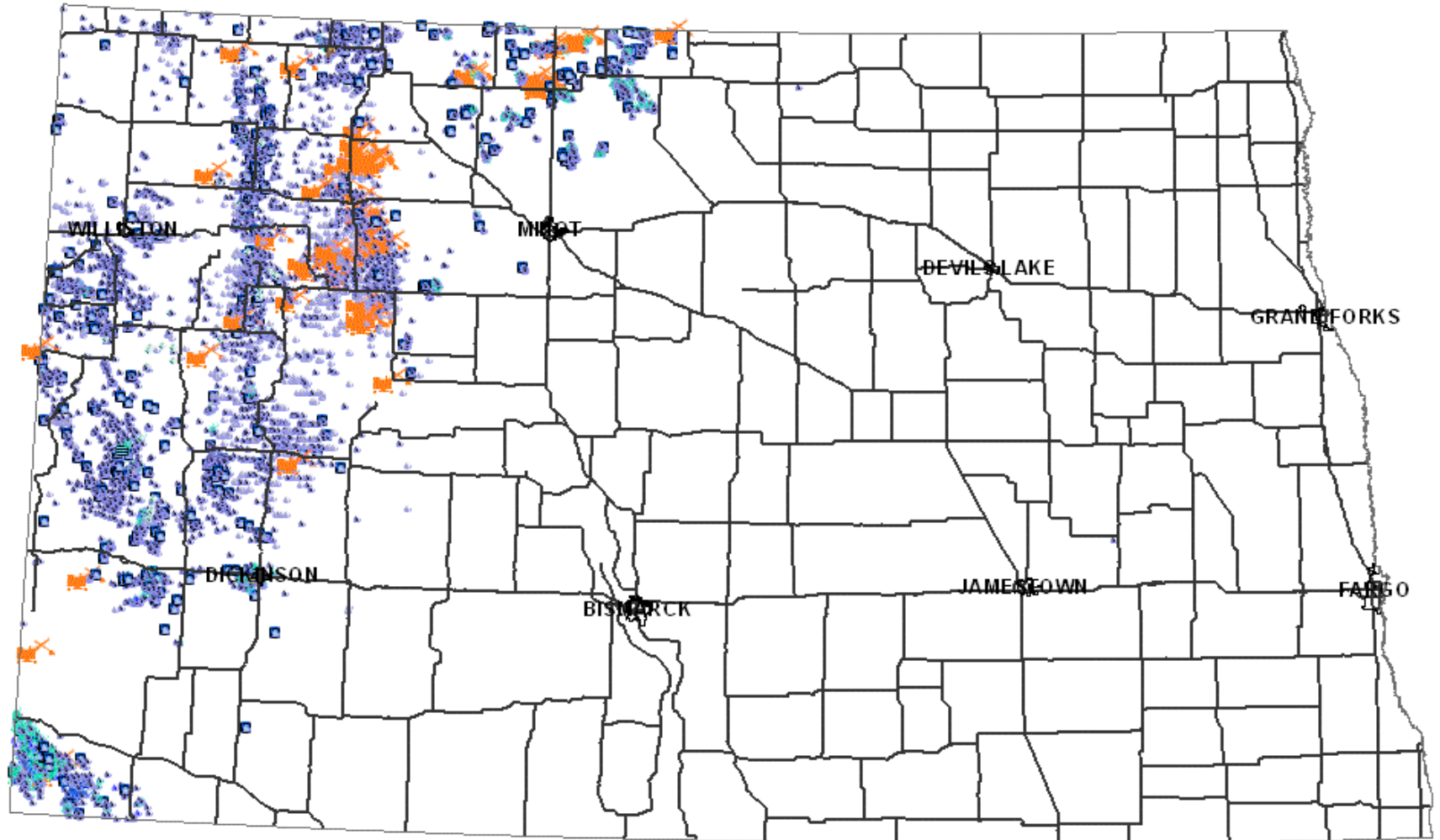
**and staff of the
North Dakota Oil and Gas Division**

Stewart Milakovic, NDDOT

**and for their invaluable assistance in preparing this
presentation.**



Oil Activity Update April 2010



Legend

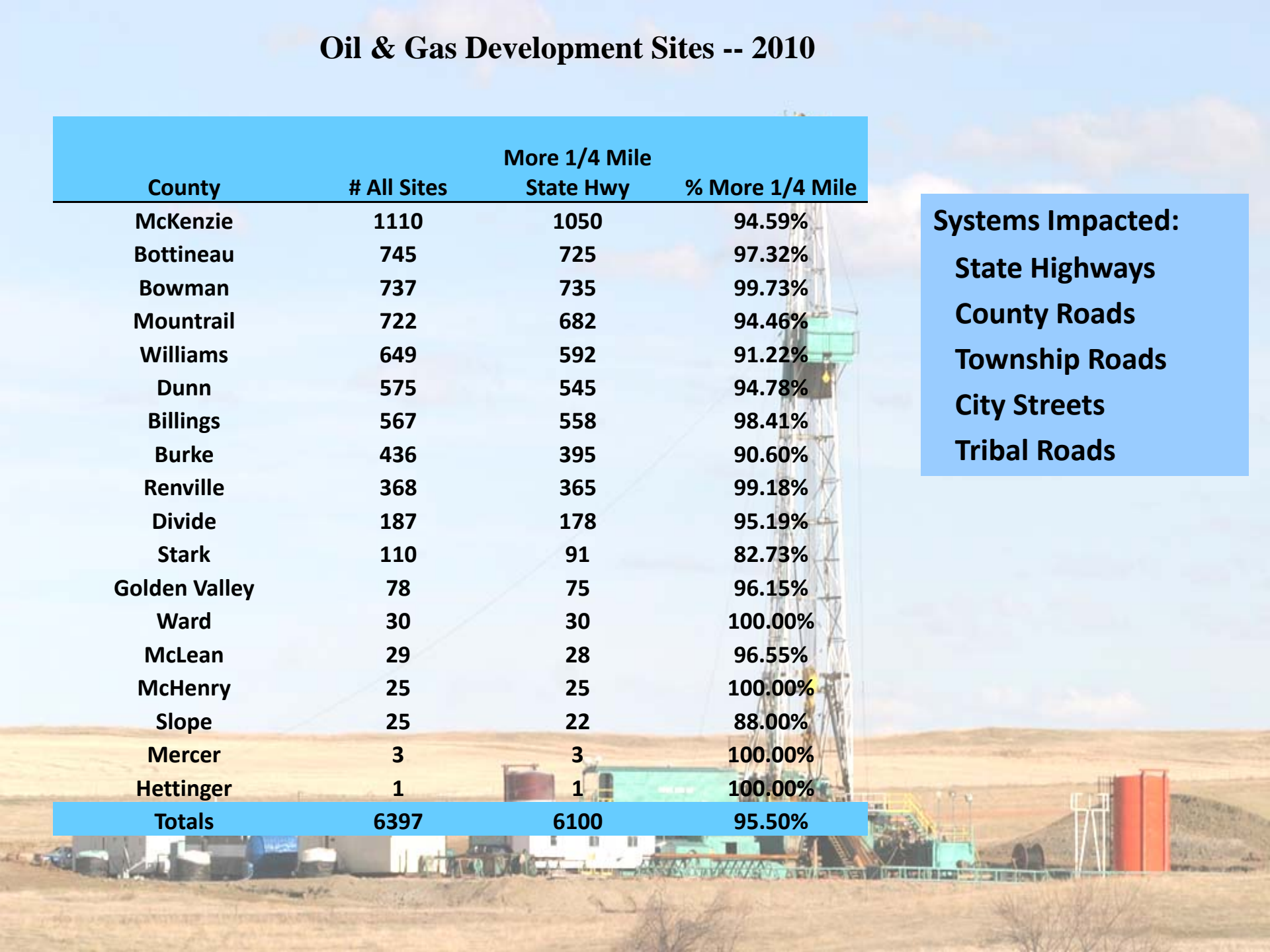
- | | | | |
|--------------------------------|----------------------|---------------------------|----------------|
| Acid Gas Disposal Sites | Dump Flood Producer | Gas Injector | State Roads |
| Air Injector | Drilling Sites | Oil and Gas Wells | Water Injector |
| Confidential Oil and Gas Wells | Gas Condensate Sites | Salt Water Disposal Sites | Water Supply |
| Dump Flood Sites | Dry Gas Sites | | |

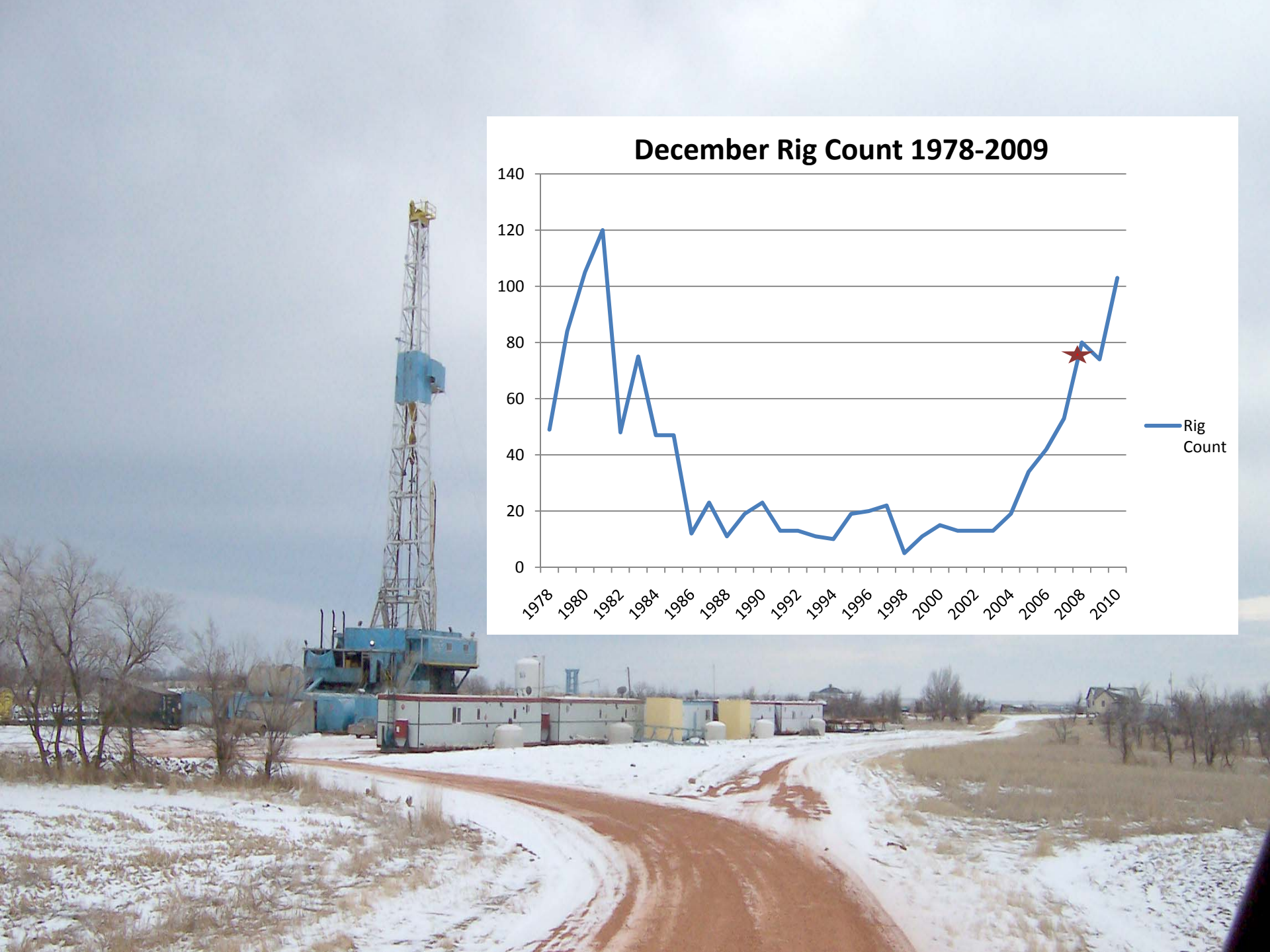
Oil & Gas Development Sites -- 2010

County	# All Sites	More 1/4 Mile State Hwy	% More 1/4 Mile
McKenzie	1110	1050	94.59%
Bottineau	745	725	97.32%
Bowman	737	735	99.73%
Mountrail	722	682	94.46%
Williams	649	592	91.22%
Dunn	575	545	94.78%
Billings	567	558	98.41%
Burke	436	395	90.60%
Renville	368	365	99.18%
Divide	187	178	95.19%
Stark	110	91	82.73%
Golden Valley	78	75	96.15%
Ward	30	30	100.00%
McLean	29	28	96.55%
McHenry	25	25	100.00%
Slope	25	22	88.00%
Mercer	3	3	100.00%
Hettinger	1	1	100.00%
Totals	6397	6100	95.50%

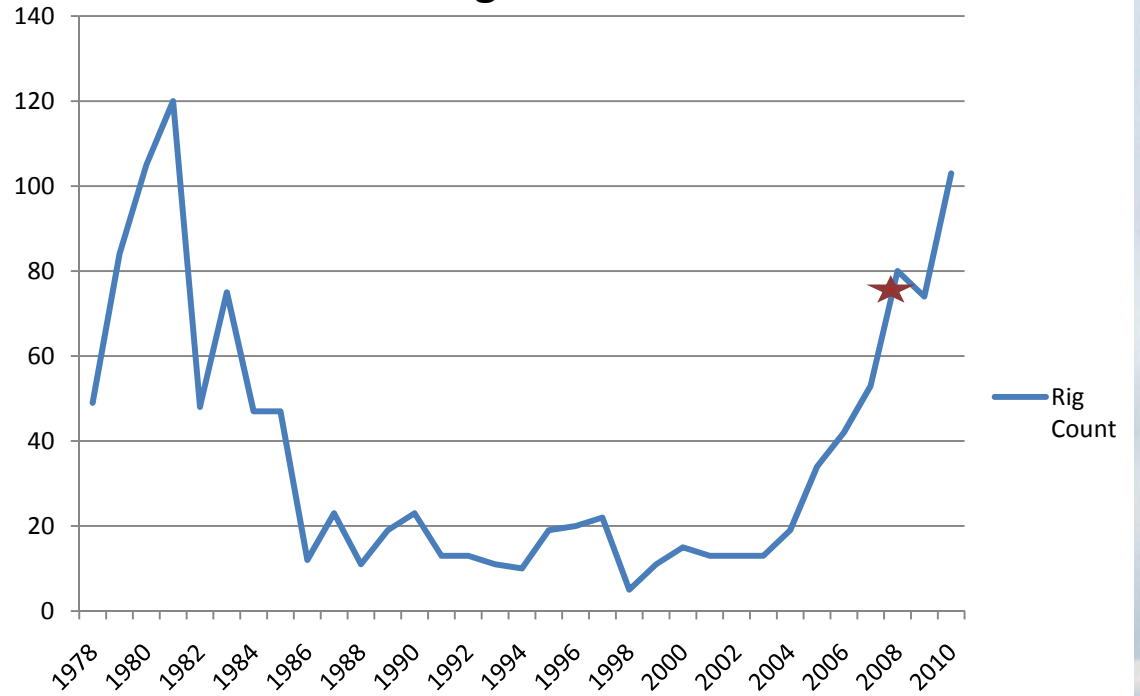
Systems Impacted:

- State Highways
- County Roads
- Township Roads
- City Streets
- Tribal Roads





December Rig Count 1978-2009



December 2009

County	Dec 09 Ranking	Dec 09 (bbls)	Wells	Avg Prod/Well
Mountrail	1	3,021,402	518	5,833
Bowman	2	1,024,929	534	1,919

August 2008 -- 4193 Wells
5,518,208 barrels
178,000 barrels per day

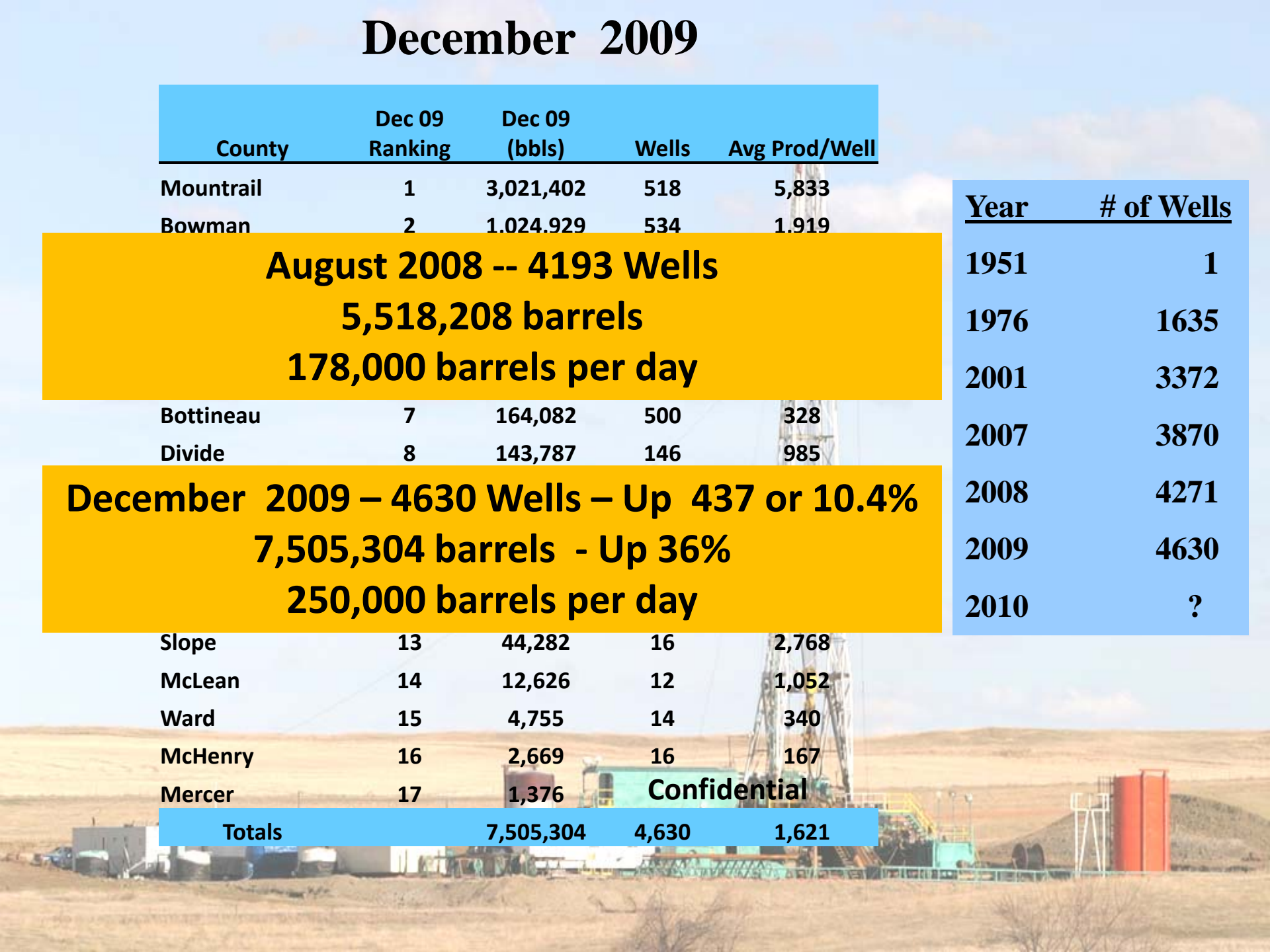
Bottineau	7	164,082	500	328
Divide	8	143,787	146	985

December 2009 – 4630 Wells – Up 437 or 10.4%
7,505,304 barrels - Up 36%
250,000 barrels per day

Slope	13	44,282	16	2,768
McLean	14	12,626	12	1,052
Ward	15	4,755	14	340
McHenry	16	2,669	16	167
Mercer	17	1,376	Confidential	

Totals		7,505,304	4,630	1,621
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Year	# of Wells
1951	1
1976	1635
2001	3372
2007	3870
2008	4271
2009	4630
2010	?

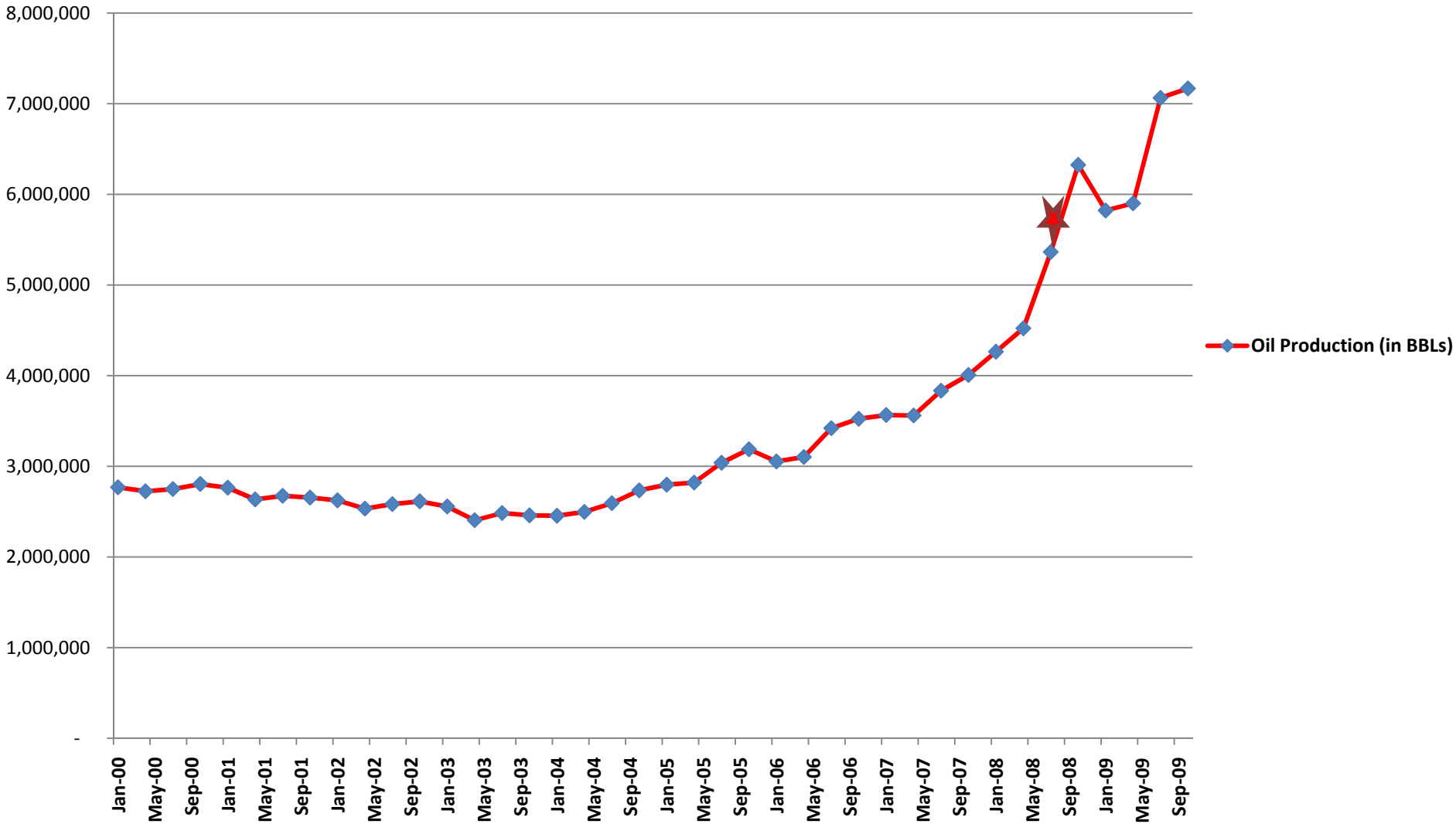


NUMBER OF WELLS DRILLED 2003 - 2009

COUNTY	2003	2004	2005	2006	2007	2008	2009	Total
Barnes					1			1
Billings	24	26	40	54	33	17	1	195
Bottineau	18	18	15	15	11	35	20	132
Bowman	133	90	132	112	56	42	9	574
Burke	5	6	15	17	24	31	15	113
Burleigh				1				1
Divide	4	7	15	14	16	22	19	97
Dunn	5	1	5	22	62	131	112	338
Emmons	1			2	1			4
Golden Valley	4	8	13	14	5	3	2	49
McHenry			1					1
McKenzie	22	38	50	66	54	97	71	398
McLean		1	3		1	3	5	13
Mercer						1	1	2
Morton		1						1
Mountrail		2	7	18	60	224	233	544
Renville	2	10	8	20	17	15	5	77
Rolette				1				1
Slope			2	2		6	2	12
Stark	4	5	6	1	4	1	1	22
Stutsman				1				1
Ward		4	1	2	2	4	5	18
Wells					1			1
Williams	19	18	20	57	61	39	35	249
TOTAL	241	235	333	419	409	671	536	2844

Monthly Oil Production (in BBLs)

Data: North Dakota Oil and Gas Division



Total Number of Loads
Vertical Well - 400
Horizontal Well - 800

OverWeight Loads - Pounds

Generator House (3) - 111,180

Shaker Tank/Pit - 122,000

Gravel Trucks, Transports, Scrapers, Motor

Suction Tank - 131,000

Graders, Dozers, Blades, Bed Trucks, Hauling

Mud Pump (2) - 164,000

Trucks, Cement Trucks, Wireline Trucks, Coil

Shaker Skid - 111,760

Tubing Units, Tankers (fresh water, salt water, acid,

Draw Works - 130,880

hot oil, propane, drilling fluids, fracturing fluids,

etc.), Backhoes, Cherry Pickers, Cement

BOP Skid - 138,680

Transports, Sand Trucks, Pump Trucks,

Top Dog House - 117,000

Roustabouts, Utility Vehicles, Cranes, Fracturing

Crown Section - 140,000

Rigs, Low Boy Trailers, etc

BOP Setting Machine - 111,000

Choke Manifold - 126,000

Derrick - 159,000

VFD House - 130,100

Mud Boat - 114,380

Substructure (2) - 136,000

Centerpiece - 139,440

Tool Room Junk Box - 124,140

MCC House - 145,160





Sand

**1.0M lbs. to 2.0M lbs.
36 Truckloads per well**

Work Over Rigs

A blue work over rig truck is parked on a dirt field. The truck has a large blue cylindrical tank on its side and a white cab with a blue and white striped bumper. In the background, a well rig is visible against a clear sky and a field of dry grass.

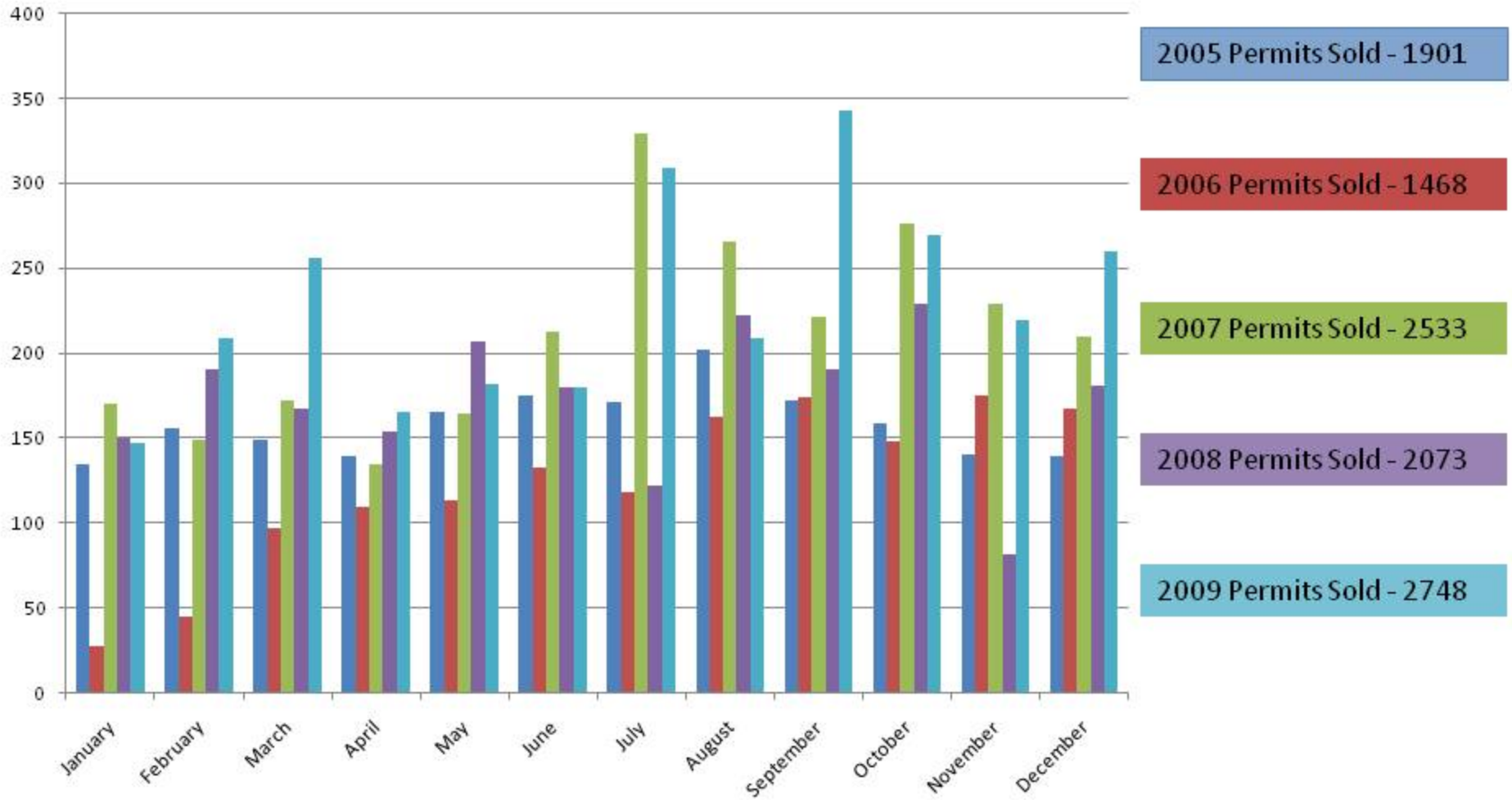
Early 1990's

Work Over Rig 90,000 Pounds

Work Over Rig 110,000 Pounds

Initially many wells are worked
3 to 4 times per year

"Self-Issued" Work Over Rig Permits Sold 2005-2009

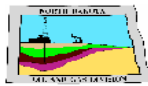


ND ASSOCIATION OF OIL & GAS PRODUCING COUNTIES

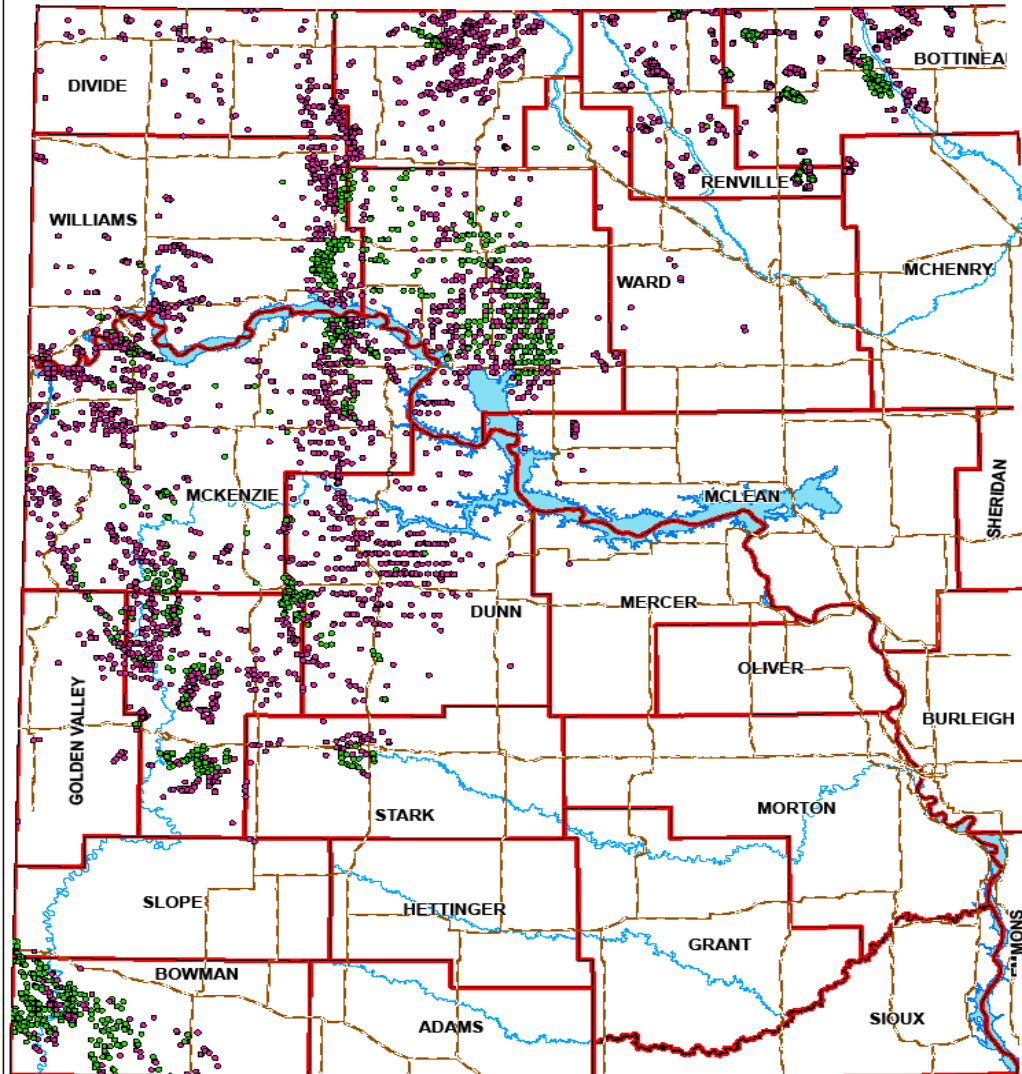
UNIFORM COUNTY PERMIT SYSTEM

PERMITS PROCESSED BY COUNTY

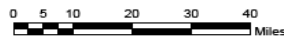
	Jul 05 - Jun 06 TOTAL	Jul 06 - Jun 07 TOTAL	Jul 07 - Jun 08 TOTAL	Jul 08 - Jun 09 YTD TOTAL	5 Months FY10 YTD TOTAL
ADAMS	0	3	2	2	2
BILLINGS	2,001	2,752	1,941	1,439	436
BOTTINEAU	120	133	129	97	55
BOWMAN	2,048	2,029	1,490	1,493	588
BURKE	209	185	308	634	182
DIVIDE	393	281	326	620	262
DUNN	505	1,701	4,110	4,656	2673
GOLDEN VALLEY	872	666	586	399	211
McKENZIE	1,603	2,687	3,143	4,276	1984
McLEAN	39	11	12	76	128
MERCER	0	0	0	107	24
MOUNTRAIL	267	396	4,074	7,660	3647
RENVILLE	158	202	198	119	65
SLOPE	597	512	482	549	172
STARK	533	878	1,595	1,617	689
WARD	81	101	137	180	419
WILLIAMS	1,236	1,471	2,109	2,320	1380
TOTALS	10,662	14,008	20,642	26,244	12,917

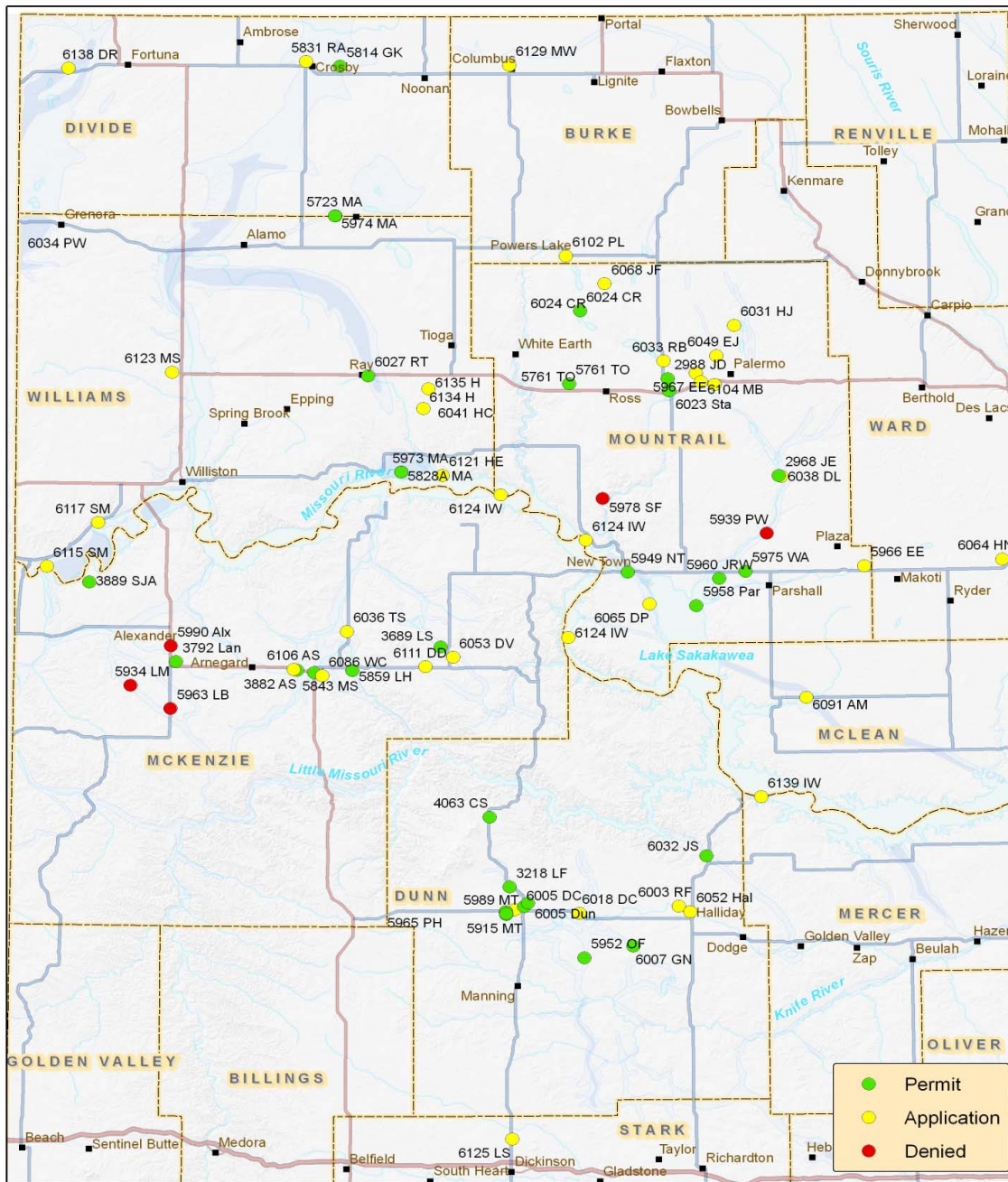


Active Oil Wells



1:1,059,401

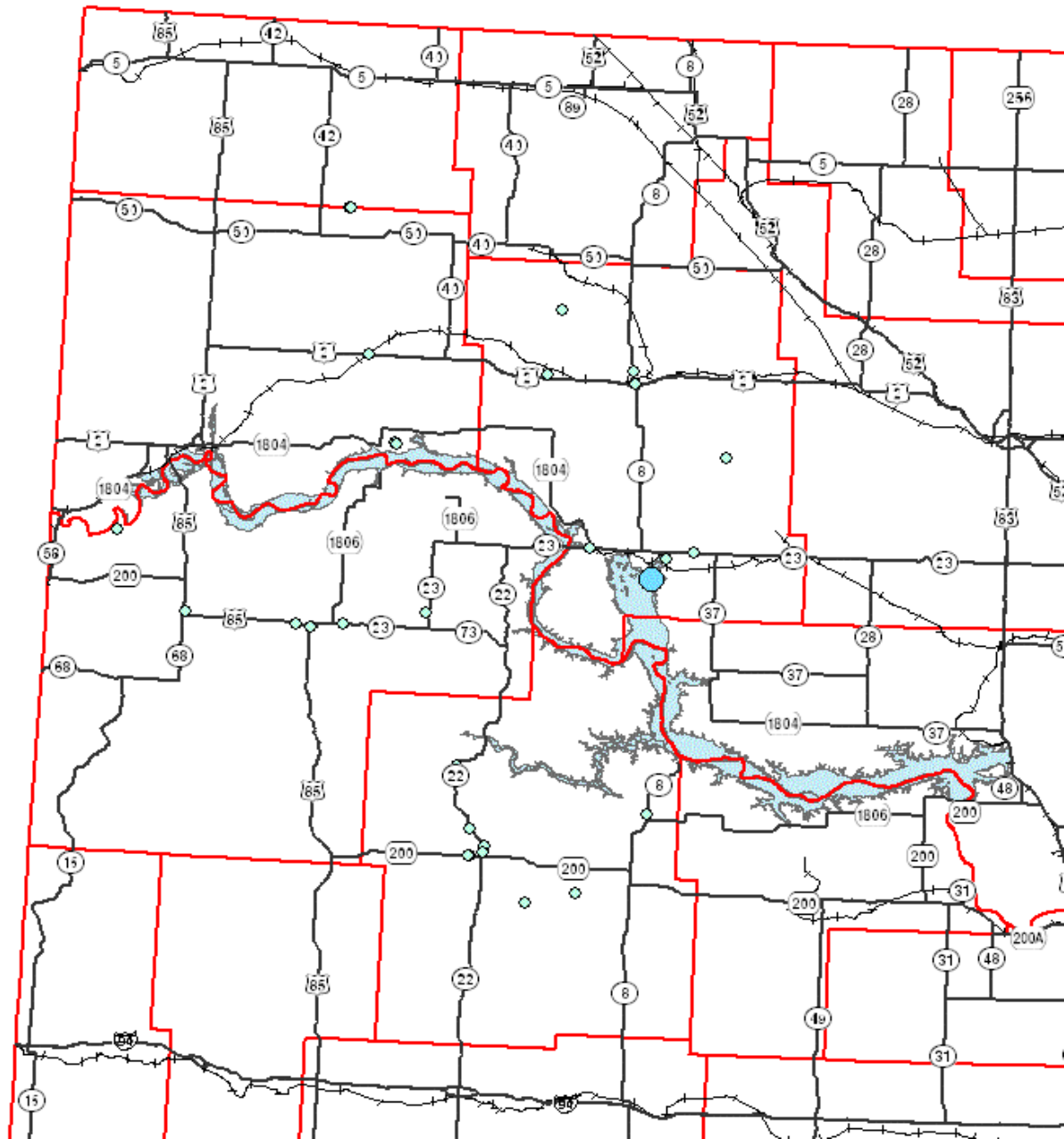
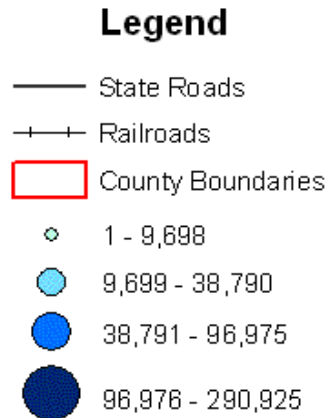




Permitted water depots & pending applications, Mar 10, 2010)

Water permit/application number and initials are next to location

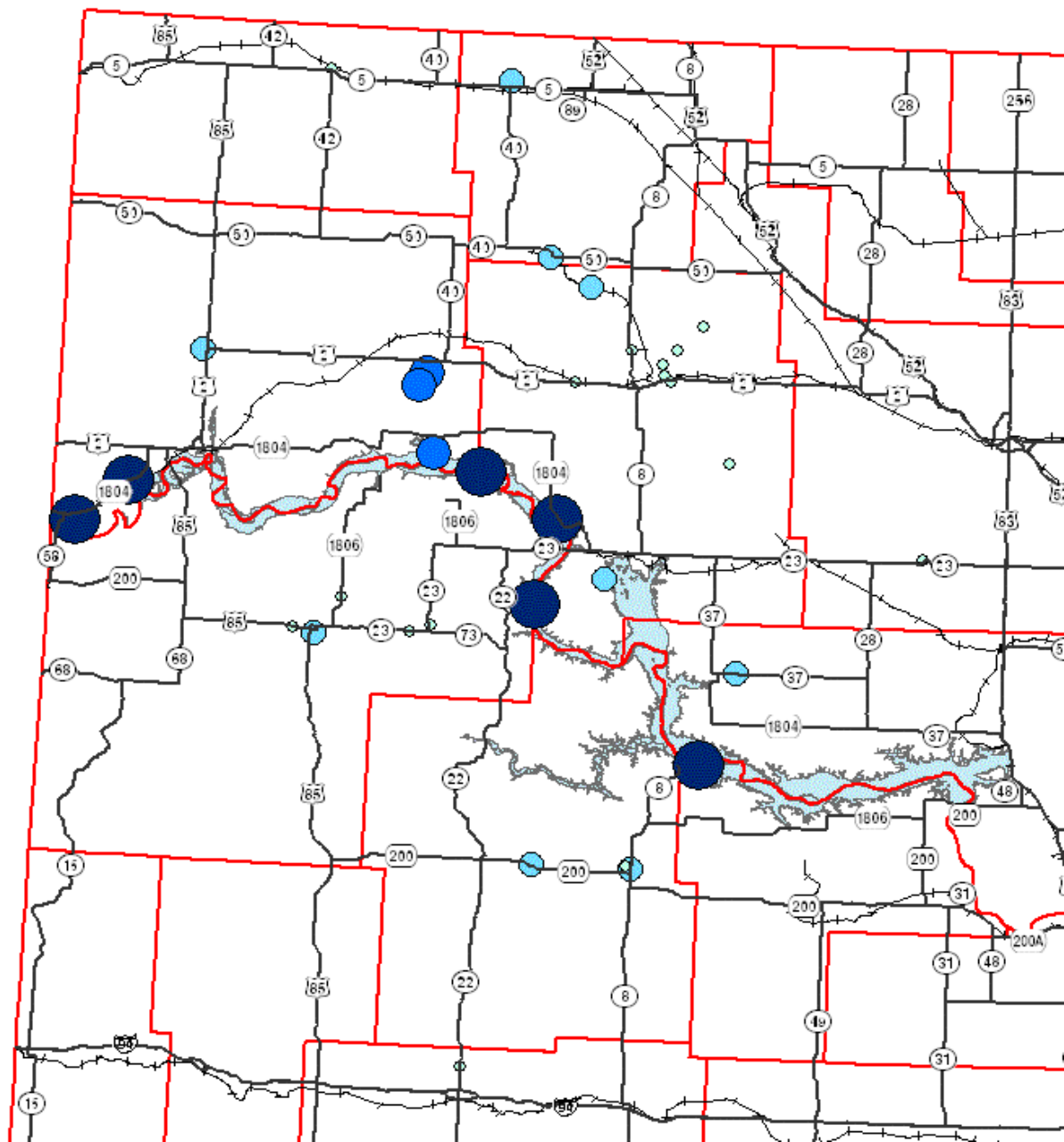
Water Depot -- Granted Permits (in Annual Truckloads)



Water Depot -- Applied for Permits (in Annual Truckloads)

Legend

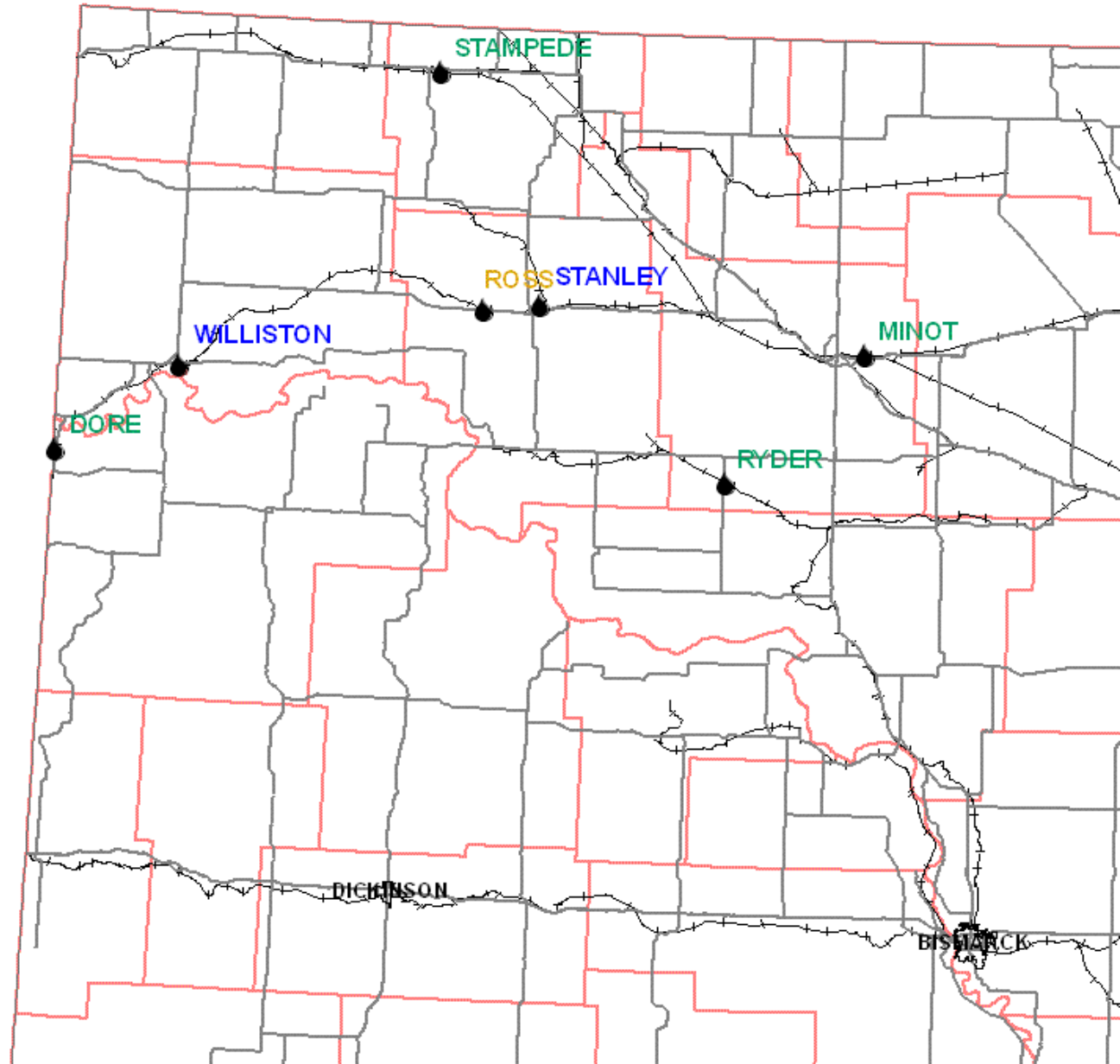
- State Roads
- + + Railroads
- ▭ County Boundaries
- ◊ 1 - 9,698
- ◊ 9,699 - 38,790
- ◊ 38,791 - 96,975
- ◊ 96,976 - 290,925









Rail Loading Facilities -- Oil

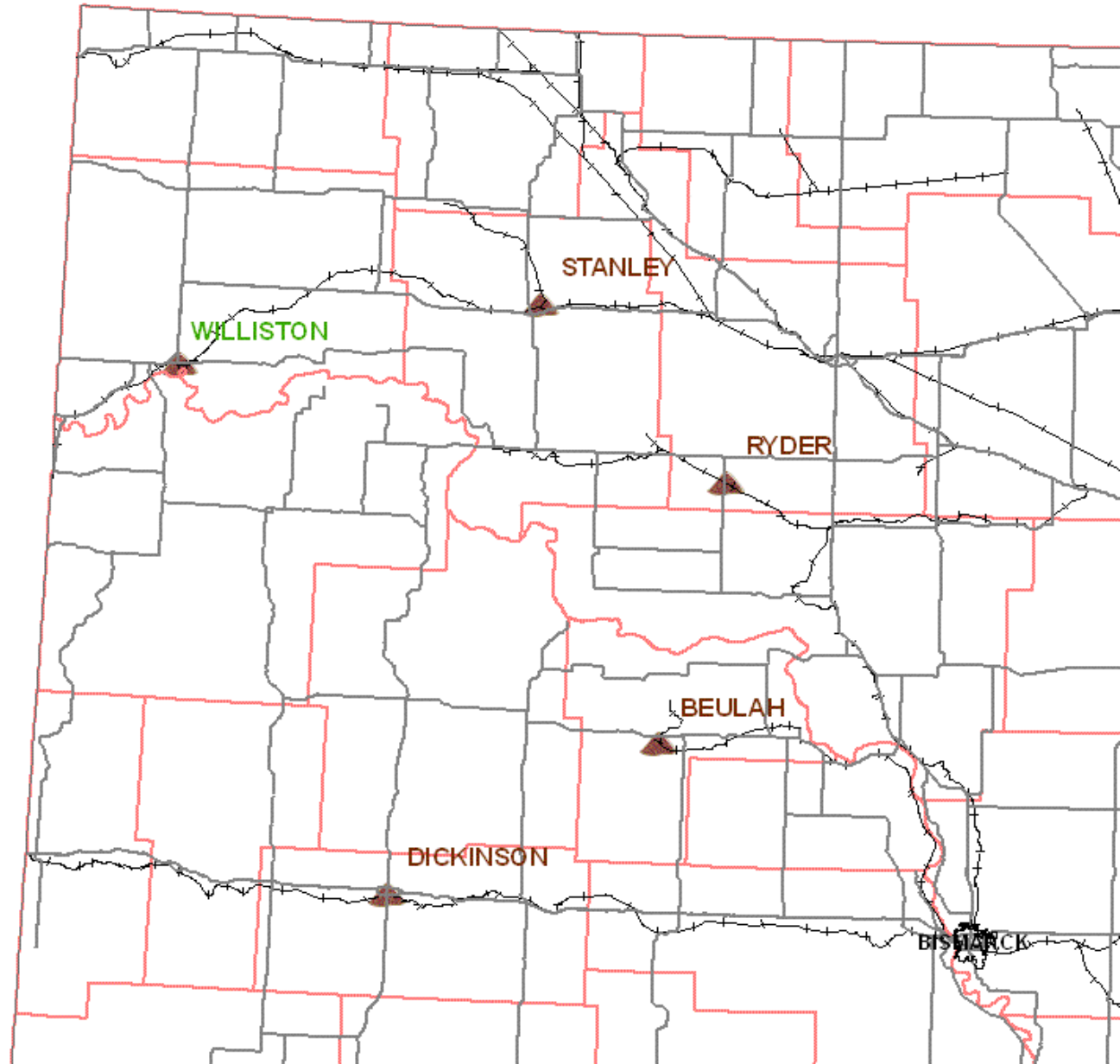
- Legend**
- Rail Loading Sites-Oil
 - State Roads
 - +— Railroads
 - County Boundaries



Rail Loading Facilities -- Sand

Legend

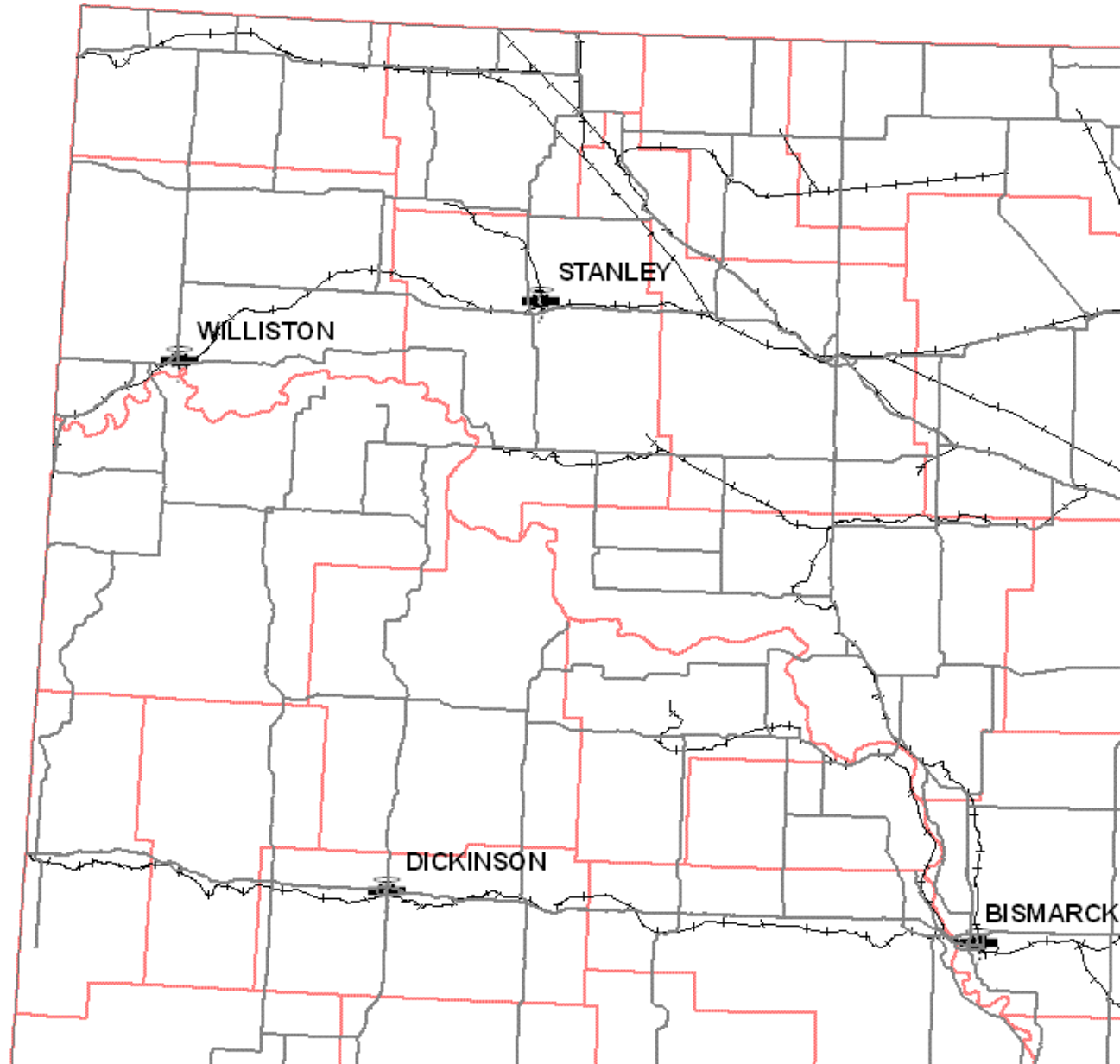
-  Rail Loading Facilities -- Sand
-  State Roads
-  Railroads
-  County Boundaries



Rail Loading Facilities -- Pipe

Legend

-  Rail Loading Sites-Pipe
-  State Roads
-  Railroads
-  County Boundaries



2008 Oil –Related Truck Traffic Estimates

<u>Loaded Truck Movement Type</u>	<u>Truckloads</u>
New Wells Drilled Non-Bakken (150)	60,000
New Wells Drilled Bakken (750)	600,000
WorkOver Rig Movements	
New Wells (900)	3,150
Existing Wells (4193)	839
Acid 2-3 Truckloads Per New Well	2,250
Crude Oil Truckloads Existing	105,348
Crude Oil Truckloads (New Bakken)	375,722
Crude Oil Truckloads (New Non-Bakken)	23,966
Freshwater (Bakken)	117,188
Freshwater (Non- Bakken)	1,674
Sand (Bakken Only)	27,000
Saltwater (Existing)	202,428
Saltwater (New-Bakken)	158,959
Saltwater (New Non-Bakken)	162,228
Abandonment 100-150 Wells Annually	3,750
Gas Plant Truck Movements	10,950
Total Truckloads (Annually)	1,855,451
Total Truckloads (Daily)	5,083

2010 Oil –Related Truck Traffic Estimates

<u>Loaded Truck Movement Type</u>	<u>Truckloads</u>	
New Wells Drilled Non-Bakken (150)	60,000	N/C
New Wells Drilled Bakken (1500)	1,150,500	600,000
WorkOver Rig Movements		
New Wells (1650)	4,125	3,150
Existing Wells (4631)	926	839
Acid 2-3 Truckloads Per New Well	4,125	2,250
Crude Oil Truckloads Existing	220,864	105,348
Crude Oil Truckloads (New Bakken)	1,318,106	375,722
Crude Oil Truckloads (New Non-Bakken)	46,587	23,966
Freshwater (Bakken)	69,940	?
Freshwater (Non- Bakken)	1,674	?
Sand (Bakken Only)	54,000	27,000
Saltwater (Existing)	201,168	
Saltwater (New-Bakken)	557,660	158,959
Saltwater (New Non-Bakken)	315,360	162,228
Abandonment 100-150 Wells Annually	3,750	N/C
<u>Gas Plant Truck Movements</u>	<u>10,950</u>	N/C
Total Truckloads (Annually)	4,019,736	1,855,451
Total Truckloads (Daily)	11,013	5,083

Thank you

Questions?

Horizontal drilling simulation:

www.northernoil.com/drilling.php

