

**FORSPAN ASSESSMENT MODEL FOR CONTINUOUS
ACCUMULATIONS--BASIC INPUT DATA FORM (NOGA, Version 9, 2-10-03)**

IDENTIFICATION INFORMATION

Assessment Geologist:	T.S. Dyman and S.M. Condon	Date:	4/18/2005
Region:	North America	Number:	5
Province:	Hanna, Laramie, Shirley Basins	Number:	5030
Total Petroleum System:	Niobrara	Number:	503003
Assessment Unit:	Niobrara Continuous Oil	Number:	50300361
Based on Data as of:	PI/Dwights 4/2004		
Notes from Assessor:			

CHARACTERISTICS OF ASSESSMENT UNIT

Assessment-unit type: Oil (<20,000 cfg/bo) or Gas (≥20,000 cfg/bo), incl. disc. & pot. additions Oil

What is the minimum total recovery per cell? 0.001 (mmbo for oil A.U.; bcfg for gas A.U.)

Number of tested cells: 76

Number of tested cells with total recovery per cell ≥ minimum: 10

Established (discovered cells): X Hypothetical (no cells):

Median total recovery per cell (for cells ≥ min.): (mmbo for oil A.U.; bcfg for gas A.U.)

1st 3rd discovered 2nd 3rd 3rd 3rd

Assessment-Unit Probabilities:

<u>Attribute</u>	<u>Probability of occurrence (0-1.0)</u>
1. CHARGE: Adequate petroleum charge for an untested cell with total recovery ≥ minimum.	<u>1.0</u>
2. ROCKS: Adequate reservoirs, traps, seals for an untested cell with total recovery ≥ minimum.	<u>1.0</u>
3. TIMING: Favorable geologic timing for an untested cell with total recovery ≥ minimum.	<u>1.0</u>
Assessment-Unit GEOLOGIC Probability (Product of 1, 2, and 3):	<u>1.0</u>

NO. OF UNTESTED CELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES

1. Total assessment-unit area (acres): (uncertainty of a fixed value)

calculated mean 841,000 minimum 799,000 mode 841,000 maximum 883,000

2. Area per cell of untested cells having potential for additions to reserves (acres): (values are inherently variable)

calculated mean 173 minimum 40 mode 160 maximum 320

uncertainty of mean: minimum 130 maximum 215

3. Percentage of total assessment-unit area that is untested (%): (uncertainty of a fixed value)

calculated mean 98.4 minimum 98 mode 98.5 maximum 98.9

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NO. OF UNTESTED CELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES
(Continued)

4. Percentage of untested assessment-unit area that has potential for additions to reserves (%):
(a necessary criterion is that total recovery per cell \geq minimum; uncertainty of a fixed value)

calculated mean 10 minimum 1 mode 4 maximum 25

Geologic evidence for estimates: Sweetspots related to areas of enhanced fractures.

TOTAL RECOVERY PER CELL

Total recovery per cell for untested cells having potential for additions to reserves:
(values are inherently variable; mmbo for oil A.U.; bcfg for gas A.U.)

calculated mean 0.08 minimum 0.001 median 0.04 maximum 1.6

AVERAGE COPRODUCT RATIOS FOR UNTESTED CELLS, TO ASSESS COPRODUCTS

(uncertainty of fixed but unknown values)

<u>Oil assessment unit:</u>	minimum	mode	maximum
Gas/oil ratio (cfg/bo)	<u>300</u>	<u>600</u>	<u>900</u>
NGL/gas ratio (bnlq/mmcfg)	<u> </u>	<u> </u>	<u> </u>
<u>Gas assessment unit:</u>			
Liquids/gas ratio (bliq/mmcfg)	<u> </u>	<u> </u>	<u> </u>

SELECTED ANCILLARY DATA FOR UNTESTED CELLS

(values are inherently variable)

<u>Oil assessment unit:</u>		minimum	mode	maximum
API gravity of oil (degrees)		<u>35</u>	<u>39</u>	<u>45</u>
Sulfur content of oil (%)		<u>0.02</u>	<u>0.1</u>	<u>0.5</u>
Depth (m) of water (if applicable)		<u> </u>	<u> </u>	<u> </u>

Drilling depth (m)

minimum	F75	mode	F25	maximum
<u>200</u>	<u> </u>	<u>1000</u>	<u> </u>	<u>5500</u>

Gas assessment unit:

		minimum	mode	maximum
Inert-gas content (%)		<u> </u>	<u> </u>	<u> </u>
CO ₂ content (%)		<u> </u>	<u> </u>	<u> </u>
Hydrogen sulfide content (%)		<u> </u>	<u> </u>	<u> </u>
Heating value (BTU)		<u> </u>	<u> </u>	<u> </u>
Depth (m) of water (if applicable)		<u> </u>	<u> </u>	<u> </u>

Drilling depth (m)

minimum	F75	mode	F25	maximum
<u> </u>				

Success ratios:

	calculated mean	minimum	mode	maximum
Future success ratio (%)	<u>25</u>	<u>5</u>	<u>20</u>	<u>50</u>

Historic success ratio, tested cells (%) 13.2

Completion practices:

1. Typical well-completion practices (conventional, open hole, open cavity, other)	<u>Conventional</u>
2. Fraction of wells drilled that are typically stimulated	<u>1</u>
3. Predominant type of stimulation (none, frac, acid, other)	<u>frac, acid</u>
4. Fraction of wells drilled that are horizontal	<u>0</u>

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES
Surface Allocations (uncertainty of a fixed value)

1. <u>Wyoming</u>	_____	represents	<u>100</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		<u>100</u>	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
2. _____	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
3. _____	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
4. _____	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
5. _____	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
6. _____	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____

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7. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

8. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

9. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

10. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

11. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

12. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO GENERAL LAND OWNERSHIPS
Surface Allocations (uncertainty of a fixed value)

1. <u>Federal Lands</u>		represents	<u>41.18</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	<u> </u>		<u>41</u>	<u> </u>
<u>Gas in gas assessment unit:</u>				
Volume % in entity	<u> </u>		<u> </u>	<u> </u>
2. <u>Private Lands</u>		represents	<u>53.09</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	<u> </u>		<u>53</u>	<u> </u>
<u>Gas in gas assessment unit:</u>				
Volume % in entity	<u> </u>		<u> </u>	<u> </u>
3. <u>Tribal Lands</u>		represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	<u> </u>		<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>				
Volume % in entity	<u> </u>		<u> </u>	<u> </u>
4. <u>Other Lands</u>		represents	<u>1.47</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	<u> </u>		<u>2</u>	<u> </u>
<u>Gas in gas assessment unit:</u>				
Volume % in entity	<u> </u>		<u> </u>	<u> </u>
5. <u>WY State Lands</u>		represents	<u>4.26</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	<u> </u>		<u>4</u>	<u> </u>
<u>Gas in gas assessment unit:</u>				
Volume % in entity	<u> </u>		<u> </u>	<u> </u>
6. <u> </u>		represents	<u> </u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	<u> </u>		<u> </u>	<u> </u>
<u>Gas in gas assessment unit:</u>				
Volume % in entity	<u> </u>		<u> </u>	<u> </u>

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7. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

8. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

9. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

10. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

11. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

12. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO FEDERAL LAND SUBDIVISIONS
Surface Allocations (uncertainty of a fixed value)

1. <u>Bureau of Land Management (BLM)</u>	represents	<u>40.3</u>	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	<u>40.59</u>	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
2. <u>BLM Wilderness Areas (BLMW)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
3. <u>BLM Roadless Areas (BLMR)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
4. <u>National Park Service (NPS)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
5. <u>NPS Wilderness Areas (NPSW)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____
6. <u>NPS Protected Withdrawals (NPSP)</u>	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____
<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

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7. <u>US Forest Service (FS)</u>	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
8. <u>USFS Wilderness Areas (FSW)</u>	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
9. <u>USFS Roadless Areas (FSR)</u>	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
10. <u>USFS Protected Withdrawals (FSP)</u>	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
11. <u>US Fish and Wildlife Service (FWS)</u>	_____	represents	0	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		0	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____
12. <u>USFWS Wilderness Areas (FWSW)</u>	_____	represents	_____	area % of the AU
<u>Oil in oil assessment unit:</u>	minimum		mode	maximum
Volume % in entity	_____		_____	_____
<u>Gas in gas assessment unit:</u>				
Volume % in entity	_____		_____	_____

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13. USFWS Protected Withdrawals (FWSP) represents _____ area % of the AU

Oil in oil assessment unit: minimum mode maximum
Volume % in entity _____ _____ _____

Gas in gas assessment unit:
Volume % in entity _____ _____ _____

14. Wilderness Study Areas (WS) represents _____ area % of the AU

Oil in oil assessment unit: minimum mode maximum
Volume % in entity _____ _____ _____

Gas in gas assessment unit:
Volume % in entity _____ _____ _____

15. Department of Energy (DOE) represents _____ area % of the AU

Oil in oil assessment unit: minimum mode maximum
Volume % in entity _____ _____ _____

Gas in gas assessment unit:
Volume % in entity _____ _____ _____

16. Department of Defense (DOD) represents _____ area % of the AU

Oil in oil assessment unit: minimum mode maximum
Volume % in entity _____ _____ _____

Gas in gas assessment unit:
Volume % in entity _____ _____ _____

17. Bureau of Reclamation (BOR) represents 0.88 area % of the AU

Oil in oil assessment unit: minimum mode maximum
Volume % in entity _____ 0.41 _____

Gas in gas assessment unit:
Volume % in entity _____ _____ _____

18. Tennessee Valley Authority (TVA) represents _____ area % of the AU

Oil in oil assessment unit: minimum mode maximum
Volume % in entity _____ _____ _____

Gas in gas assessment unit:
Volume % in entity _____ _____ _____

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19. Other Federal represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

20. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO ECOSYSTEMS
Surface Allocations (uncertainty of a fixed value)

1.	<u>Central Basin and Hills (CNBH)</u>	represents	<u>93.14</u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	_____	<u>93</u>	_____
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	_____	_____	_____
2.	<u>Greater Green River Basin (GGRV)</u>	represents	<u>6.86</u>	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	_____	<u>7</u>	_____
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	_____	_____	_____
3.	_____	represents	_____	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	_____	_____	_____
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	_____	_____	_____
4.	_____	represents	_____	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	_____	_____	_____
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	_____	_____	_____
5.	_____	represents	_____	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	_____	_____	_____
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	_____	_____	_____
6.	_____	represents	_____	area % of the AU
	<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
	Volume % in entity	_____	_____	_____
	<u>Gas in gas assessment unit:</u>			
	Volume % in entity	_____	_____	_____

7. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

8. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

9. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

10. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

11. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

12. _____ represents _____ area % of the AU

<u>Oil in oil assessment unit:</u>	minimum	mode	maximum
Volume % in entity	_____	_____	_____

<u>Gas in gas assessment unit:</u>			
Volume % in entity	_____	_____	_____

