Butler #3 & Simpson #1
Pressure Tests

Performed: April 12th, 2023

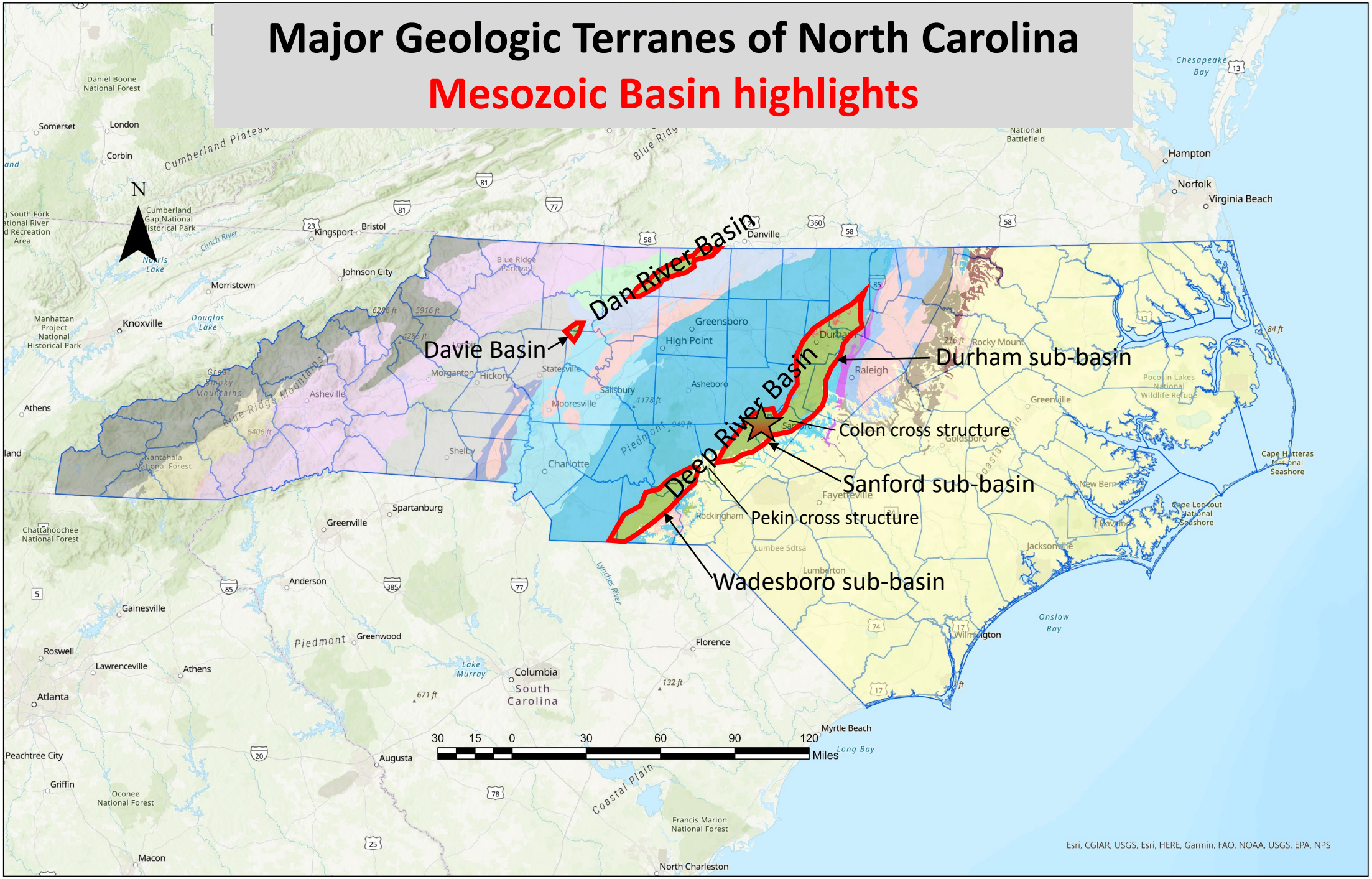
Attendees: Russ Patterson, Josh Patterson (Patterson Exploration Services)

Dr. Kenneth Taylor, Jim Chapman, Dwain Veach (North Carolina Geological Survey)

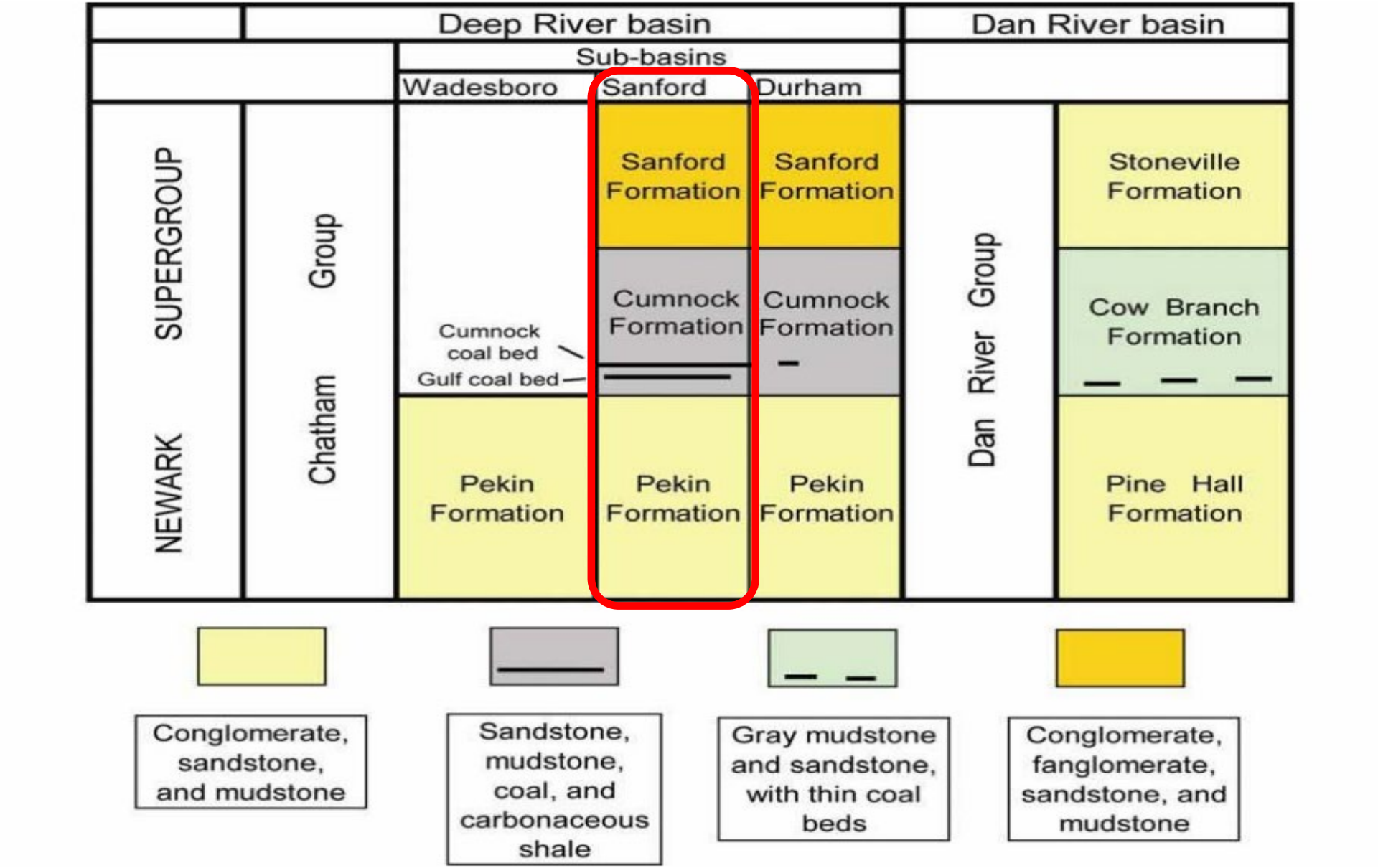
Presentation by: Dwain Veach (Sr. Geologist, Energy & Minerals)

Major Geologic Terranes of North Carolina

Mesozoic Basin highlights



Generalized Stratigraphic Column for NC Mesozoic Basins



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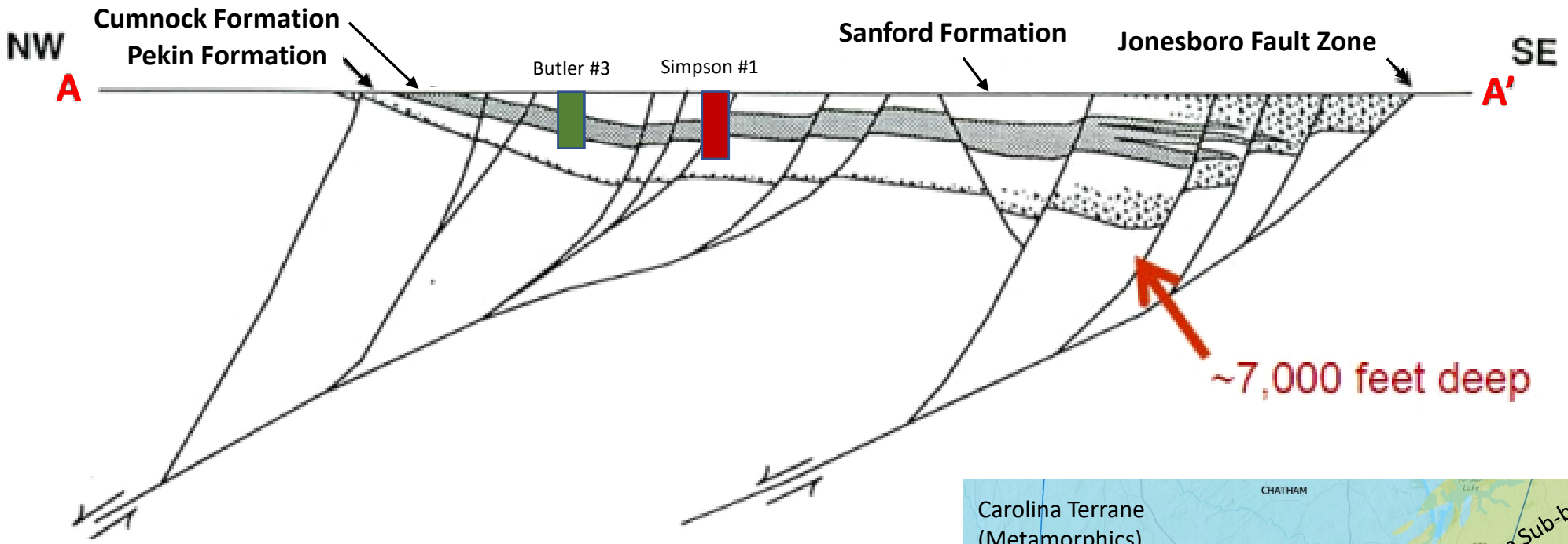
SANFORD SUB-BASIN OF THE DEEP RIVER BASIN



vertical scale = horizontal scale

5 km

Mostly fluvial, red and brown clastic rocks

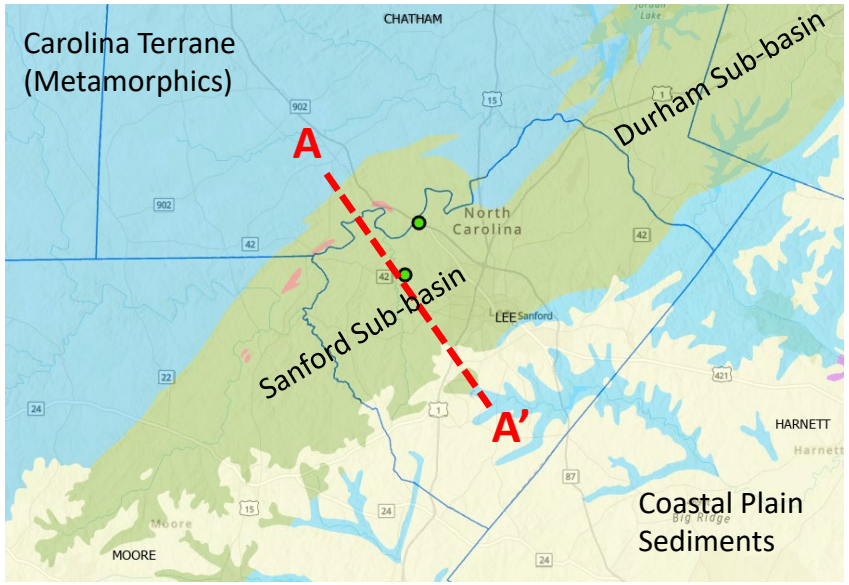
Lacustrine gray and black fine-grained clastic rocks

Red, brown, and gray conglomerate and sandstone

Major normal faults

For illustration purposes only.

Wellbore locations and cross-section index line approximated. Wellbores projected onto the estimated profile location.



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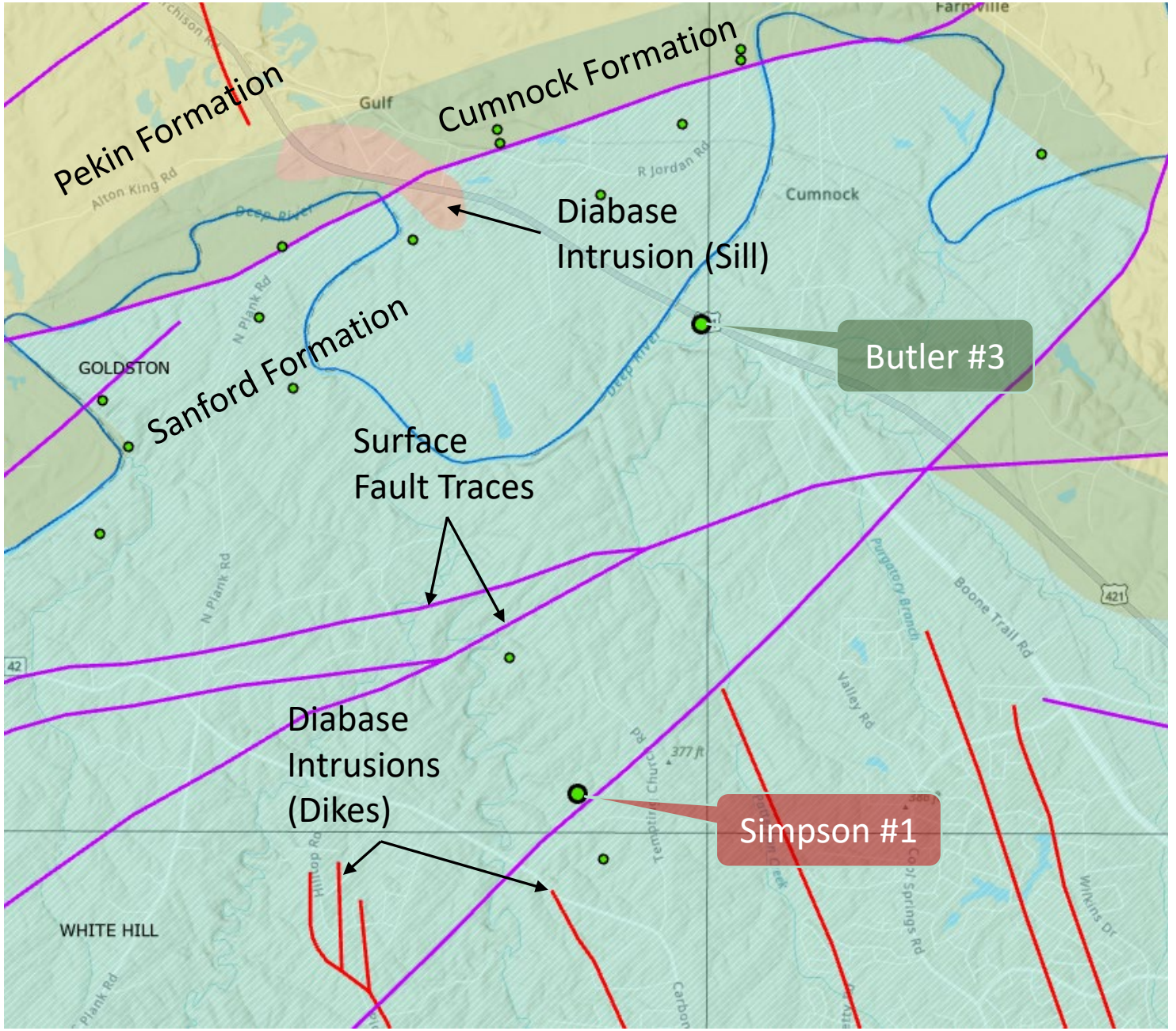
Deep River Coal Field Area Geology



Legend

Geologic map of NC_1985 (background colors)

Geologic surface fault traces (purple lines)

Diabase dikes (red lines)

Area wells (green circles)

Example Dual Completion Well Configuration

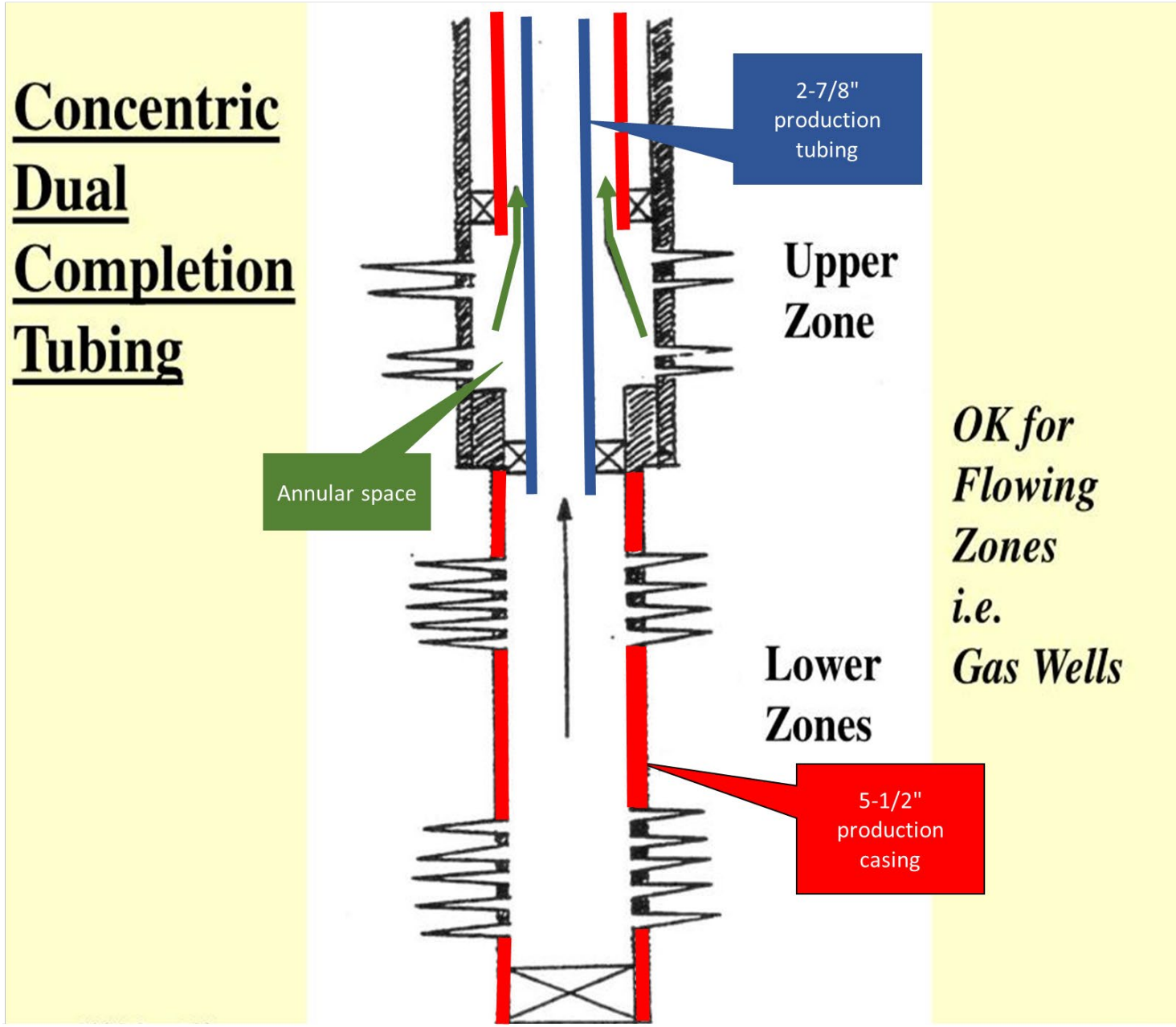


Image for illustration purposes only. Modified after PPT - Historical Review of Dual and Multiple Completions PowerPoint Presentation - ID:6697558 (slideserve.com) **Not to scale**

Field Notes

Date:		4/12/2023
Time:		8:30-10:30 AM
Temperature:		~65°F
Valve:		0.5" valve opened fully with each test
Tubing Size:		2-7/8"
Casing Size:		5-1/2"

Well	Producing String	Geologic Zone	Initial Shut-In Pressure (psi)	Drawdown_1 Time (min.)	Drawdown_1 Pressure (psi)	Buildup_1 Time (min.)	Buildup_1 Pressure (psi)	Drawdown_2 Time (min.)	Drawdown_2 Pressure (psi)	Buildup_2 Time (min.)	Final Shut-in Pressure (psi)
Simpson #1	Tubing	Lower: various Coal Beds	no gauge reading	Quickly diminishing blow audible for ~1 minute.	no gauge reading						
Simpson #1	Annulus	Upper: Cumnock Shales/Siltstones /Sandstones	275	2.5	225	2	228 (est.)	5	160	30	200
Butler #3	Tubing	Lower: various Coal Beds	no gauge reading	Slowly diminishing blow audible for ~3 minutes. No visible vapor flow after 5 minutes.	no gauge reading						
Butler #3	Annulus	Upper: Cumnock Shales/Siltstones /Sandstones	900	5	800	10					860

Simpson #1

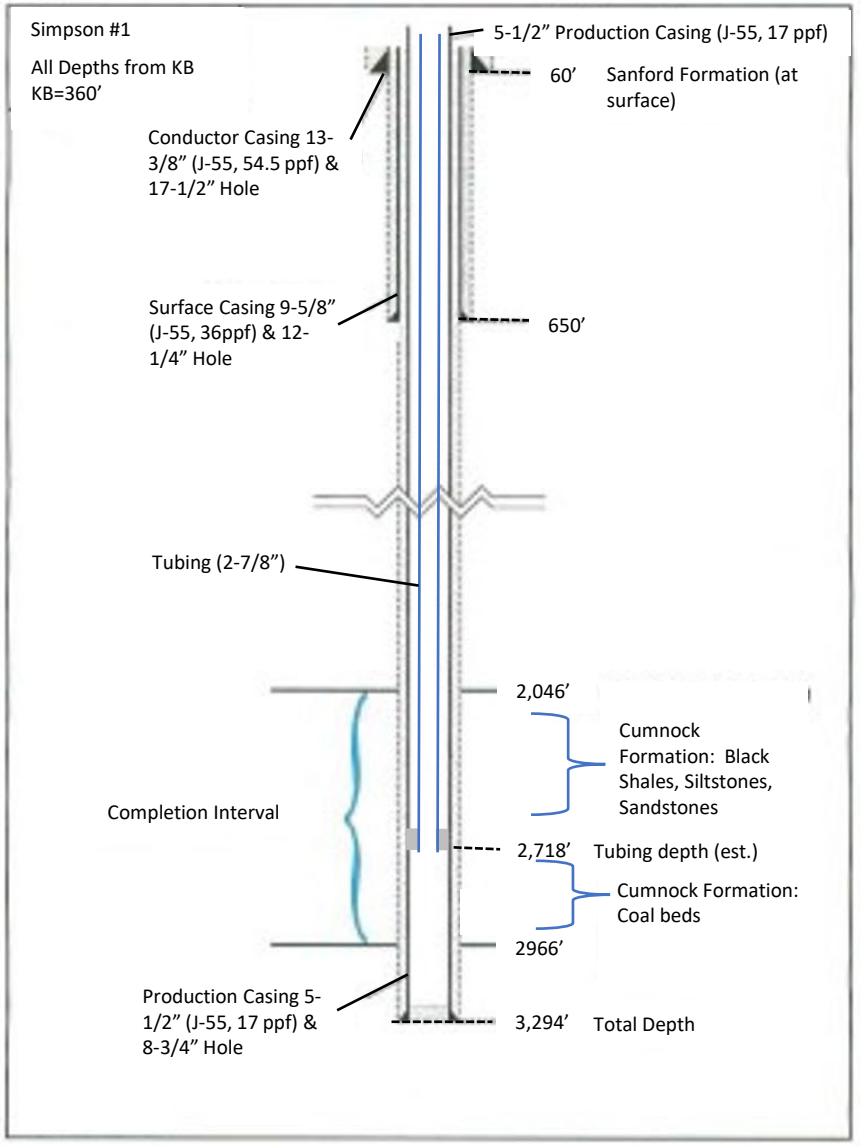
Pay Criteria	Minimum	Maximum
Porosity	0.5%*	20%
Vshale	0%	25%
Sw	0%	60%

Petrophysical Analysis by Digital Formation, Inc.

**Anomalously low value used on the presumption that gas-bearing sands are fractured and thus contributing to reservoir quality.*

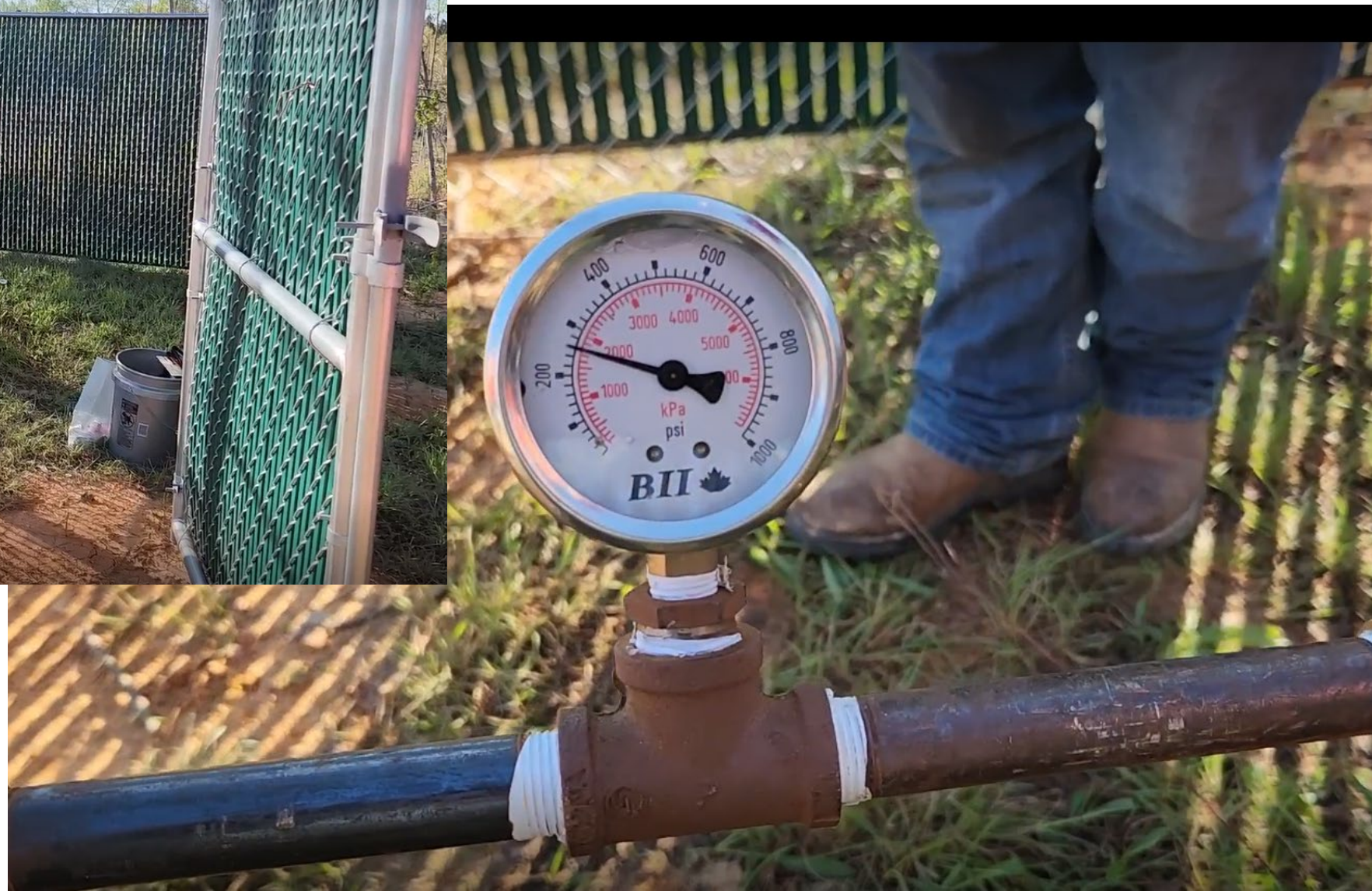
Volumetrics based on 160-acre drainage, Bg = 0.015 RCF/SCF

	Interval 2,250 – 2,500 ft	Interval 2,500 – 3,000 ft	Interval 3,000 – 3,294 ft	Total
Pay Thickness, ft	50	71.8	29	150.8
Porosity, %	3.2	3.4	2.4	3.2
Water Saturation, %	46.3	43.4	45.5	44.7
Gas-In-Place, MMCF	400	650	185	1,225

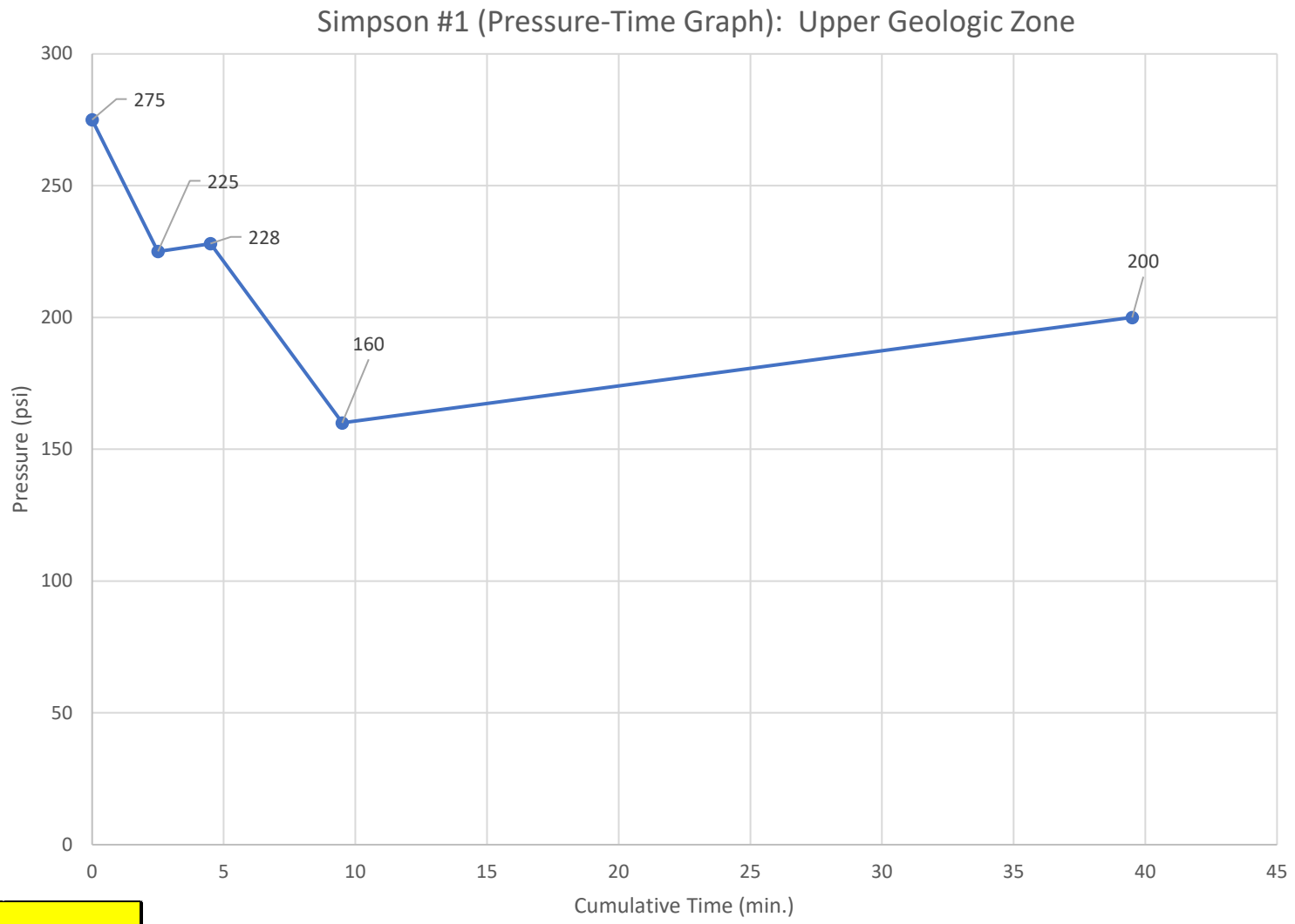


Images modified after Jeff Reid (NCGS) Denver AAPG presentation: 07-05-2011

Simpson #1



Simpson #1



Simpson #1 (Annulus)		
Time (min.)	Pressure (psi)	Notes
0	275	
2.5	225	
4.5	228	estimated
9.5	160	
39.5	200	

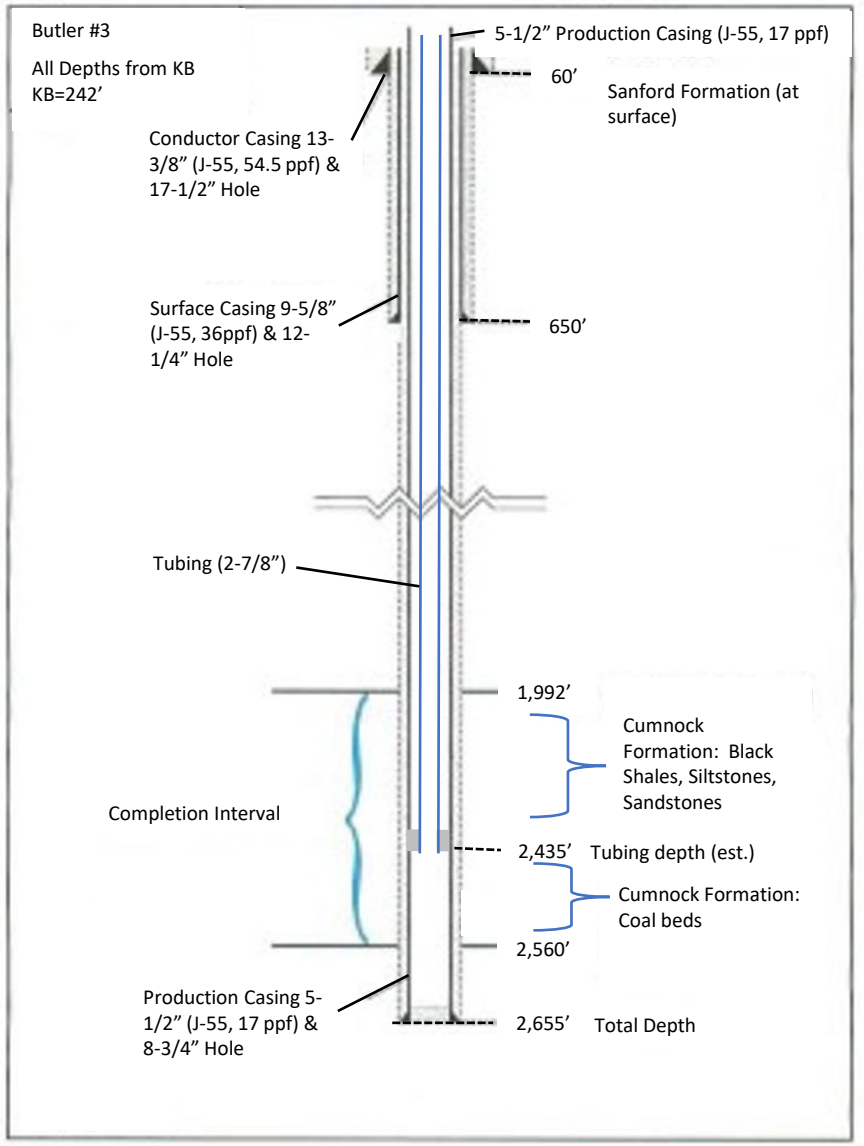
Butler #3

Pay Criteria	Minimum	Maximum
Porosity	4%	20%
Vshale	0%	25%
Sw	0%	60%

Petrophysical Analysis by Digital Formation, Inc.

Volumetrics based on 160-acre drainage, Bg = 0.015 RCF/SCF

	Interval 1,700-2,300 ft	Interval 2,300 - 2,655 ft	Both
Pay Thickness, ft	6	5.9	11.9
Porosity, %	12.6	11.8	12.1
Water Saturation, %	32.9	45.8	39.2
Gas-In-Place, MMCF	230	175	405



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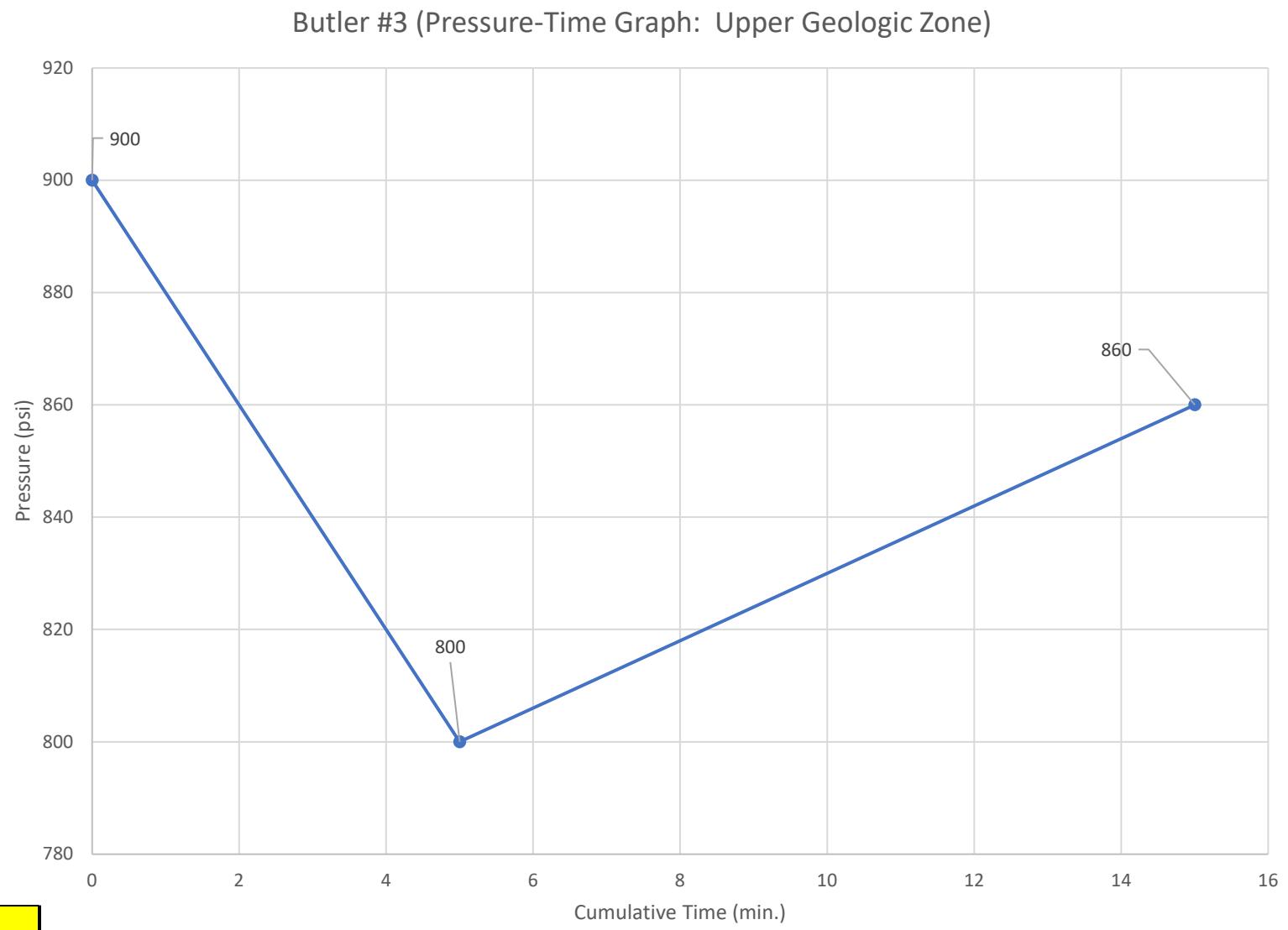
Butler #3

Butler #3



Butler #3 (Annulus)	
Time (min.)	Pressure (psi)
0	900
5	800
15	860

Thank you!

Questions?