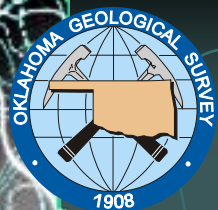


The Booch Gas Play

In Southeastern Oklahoma

February 25, 2009



The Booch Gas Play

Workshop - Agenda

- **Introduction**

- **Regional Study**

Overview / Methodology

Stratigraphy

Geologic History / Regional Mapping

*******Break*******

Petroleum System

- **Field Study - Brooken (Texanna SW)**

*******Lunch*******

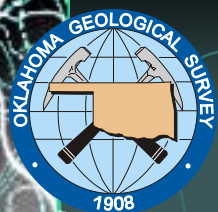
- **Drilling and Completion Practices (Max Tilford)**

- **Field Study - Reams Southeast**

*******Break*******

- **Field Study - Pine Hollow South**

- **Summary – Conclusions / Discussion**



Materials

Special Publication

CD

ArcExplorer Study Files

Data Files (Regional and Field Study Spreadsheets)

Publication Files

Figures (Corel and pdf)

Plates (Corel and pdf)

Regional Maps (shape files)

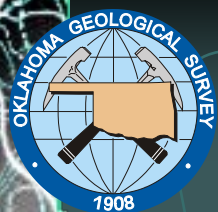
O.G.S. General Oil and Gas Reference Files

Oil and Gas Publication Listing

Core/Core Analysis Database

Sources of Oklahoma Oil and Gas Data

State Production Maps & Field Tables

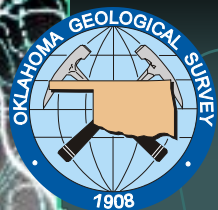


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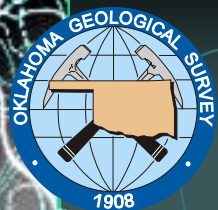
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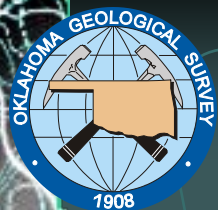
Booch Gas Play Regional Datasheet (Example)

							"Upper Booch"							
Well Data							(Top McAlester Coal Equiv) "PS-0"				"PS-1"			
Operator	Lease	No.	Sect	T (N)	R (E)	K.B.E.	Top MD	Top SS	Isopach	Gr Sd	Top MD	Top SS	Isopach	Gr Sd
Tucker	Parks	1	11	1	7	773	1,397	-624	91	4	1,488	-715	44	0
Mercury	Daisy	2	3	1	8	636	785	-149	105	0	890	-254	117	0
Boyle	Keifer-Woods	1	16	1	8	654	1,633	-979	149	0	1,782	-1,128	83	0
Tierra	Clarita	1	25	1	8	689	2,049	-1,360	116	0	2,165	-1,476	70	0
Seaboard	Rhynes	1	30	1	8	744	965	-221	55	0	1,020	-276	35	0
Sinclair	Mayer	1	2	1	9	706	1,410	-704	100	11	1,510	-804	165	0
Texaco	Brown	1	5	1	9	663	1,218	-555	117	18	1,335	-672	143	0
Tidewest Oil	Martin	26-1A	26	1	9	658	770	-112	125	10	895	-237	105	9
Walker	Taylor	1	31	1	9	627	2,225	-1,598	43	0	2,268	-1,641	162	10
XAE	Nelson	1	33	1	9	608	712	-104	93	2	805	-197	115	9
Santa Fe Minerals	Avanzini	1	1	1	10	656	1,795	-1,139	97	2	1,892	-1,236	148	0
Tenn Gas	Hudson	1	7	1	10	726	1,490	-764	90	22	1,580	-854	105	0
Santa Fe Minerals	Helms	12-1	12	1	10	674	1,228	-554	122	15	1,350	-676	152	0
Pontotoc	Eddings	1	20	1	10	709	1,188	-479	102	5	1,290	-581	155	0
Tide West	Barnett	1	30	1	10	801	1,268	-467	103	2	1,371	-570	127	0
Anderson-Prichard	Cook	2	15	1	11	602	1,300	-698	180	0	1,480	-878	95	0
Pasotex	Underhill	1	26	1	11	732	3,835	-3,103	163	0	3,998	-3,266	212	0
Mapp Expl	Daniel	1	16	2	7	714	1,595	-881	70	38	1,665	-951	45	16
Huber	Cannon	1	20	2	7	744	1,595	-851	27	12	1,622	-878	28	11
Ascent Energy	Nefu	15-7	22	2	7	723	1,622	-899	48	14	1,670	-947	55	0
Continental	Thompson	1	32	2	7	724	1,385	-661	17	13	1,402	-678	48	0
Boyle	McDonald	2	35	2	7	706	962	-256	53	7	1,015	-309	60	0
Atmar	Lafever	2	3	2	8	708	1,257	-549	55	2	1,312	-604	58	2
Tx NM Dev Co	Polk	1	8	2	8	738	1,328	-590	42	0	1,370	-632	70	0
Tidewater	Bullard	1	14	2	8	703	1,455	-752	65	18	1,520	-817	100	0
Sohio	Guth	1	22	2	8	723	1,745	-1,022	70	16	1,815	-1,092	60	3
Ascot Oils	Braly	B-1	30	2	8	655	1,630	-975	55	0	1,685	-1,030	50	0
Pan Am	Roberts	1	32	2	8	650	1,560	-910	70	5	1,630	-980	40	0



Booch Gas Play Field Study (Example Datasheet)

Brooken (Texanna SW) Field Study									
Booch Producer					(Upper Booch)				
Mapped Value					PS-2				
Lease Name	#	Operator Name	Location	KBE	Top MD	Top SS	Isopach	Top MD	Top SS
HOWDESHELL	1	HOLD OIL CORP	1 9N 17E C NE SW	852	1417	-565	156	1573	-721
DANIEL A	1	CITIES SERVICE	1 9N 17E SW NE SE	914	1468	-554	155	1623	-709
J C HOUCK	1	HOLD OIL CORP	1 9N 17E C S2 NW	801	1416	-615	164	1580	-779
1ST OKLA RESOURCES	1	HOLD OIL CORP	1 9N 17E C E2 NW	838	1434	-596	38	1472	-634
PHILLIPS /E/	1	CITIES SERVICE	1 9N 17E NESWNENE	833	1338	-505	126	1464	-631
HUNTER	1	KERR-MCGEE CORP	2 9N 17E C NE SE	804	1456	-652	173	1629	-825
RUTH LYNN	1	ROYALTY PETROLEUM CO	2 9N 17E S2 NE NE	606	1090	-484	170	1260	-654
ARDETH-SALLAS	1	KERR-MCGEE CORP	3 9N 17E C SE	862	1645	-783	166	1811	-949
PHILLIPS	1	HOLDEN CHARLES ETAL	3 9N 18E SE SE SE	Logs Unavailable		#VALUE!	0		#VALUE!
FITZER-FEDERAL UNIT	1	SUN EXPL & PROD CO	3 9N 18E NW NE SW	598	984	-386	162	1146	-548
PHILLIPS J H	1	HASKELL DRLG	3 9N 18E SW SE SE	Logs Unavailable		#VALUE!	0		#VALUE!
BALLARD	1	GLENCO PET CORP	3 9N 18E C SE SE	608	993	-385	152	1145	-537
PHILLIPS	3	GRIMM L S	3 9N 18E C SW SE	Logs Unavailable		#VALUE!	0		#VALUE!
ARMY CORPS OF ENG	2	HOLD OIL CORP	3 9N 18E C NE SE	603	992	-389	168	1160	-557
MOSELEY	1	SUN OIL COMPANY	3 9N 18E SESEWNNE	606	972	-366	156	1128	-522
USA	31	SUN OIL COMPANY	3 9N 18E NENESWNW	599	947	-348	144	1091	-492
BROOKEN	1	SUN OIL COMPANY	4 9N 18E SE SE SE	602	1031	-429	157	1188	-586
ARMY CORP OF ENGNRS	1	HOLD OIL CORP	4 9N 18E SESWNENE	598	NL	#VALUE!	#VALUE!	1158	-560
MCKINNEY	1	SUN OIL COMPANY	4 9N 18E E2 NW SW	709	1245	-536	159	1404	-695
FITZER	1	TEXAS PACIFIC OIL CO	4 9N 18E C SW NW	715	1248	-533	159	1407	-692
WENDELL	1	SUN OIL COMPANY	5 9N 18E C NE	856	1331	-475	154	1485	-629
WENDELL	2	SUN OIL COMPANY	5 9N 18E C SE	666	1267	-601	138	1405	-739
WENDELL	4	SUN OIL COMPANY	5 9N 18E C NW	759	1422	-663	166	1588	-829
WENDELL	3	SUN OIL COMPANY	5 9N 18E E2E2W2SW	929	1541	-612	154	1695	-766



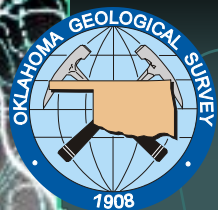
Oklahoma Geological Survey

Booch Cores

Located At OPIC (Oklahoma Petroleum Information Center)

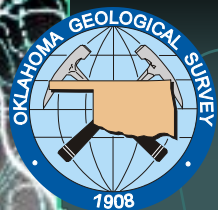
Sorted by Township

TRS	COUNTY	OPERATOR	WELL NAME	TOP	BOT	FEET	DIAM	COND*
04N-07E-24	PONTOTOC	IDEAL CEMENT	TOBY 3	1646	1721	75	3.5	W
04N-11E-27	HUGHES	D&J OIL	NICHOLS 1-27	3007	3026	19	2.5	W
05N-07E-26	PONTOTOC	MAGNOLIA	REED 2	2146	2151	5		C
05N-07E-26	PONTOTOC	MAGNOLIA	REED 4	2068	2076	8		C
05N-07E-26	SEMINOLE	MAGNOLIA	FLEET- OSBORN 3	2302	2315	13		C
05N-08E-11	HUGHES	WILSHIRE	BOND 2-C	2331	2361	30	3.5	W
05N-08E-14	HUGHES	WILSHIRE	BOND 17	2288	2318	30	3.5	W
05N-08E-14	HUGHES	WILSHIRE	BOND A 37	2280	2310	30	3.5	W
05N-08E-14	HUGHES	MEGARGEL	BOND 28-A	2258	2283	25	3.5	W
05N-08E-16	PONTOTOC	DELANEY	MILLER 1	2191	2209	18	3	C
05N-08E-20	PONTOTOC	GULF	HALL - BOND 1	2144	2158	14	3	C
05N-08E-20	PONTOTOC	DELANEY	HALL-BOND 1	2144	2158	14	3	C
05N-08E-20	PONTOTOC	DELANEY	BUSBY & WHITNEY 1	2164	2177	13	2.5	C
05N-08E-21	PONTOTOC	DELANEY	SHIPLEY 4	2241	2248	7	3	C
05N-08E-21	PONTOTOC	DELANEY	SHIPLEY 3	2151	2161	10	2.5	W
05N-08E-24	PONTOTOC	DELANEY	DONAGHEY - BROWN 1	2651	2665	14	2.5	C
05N-08E-28	PONTOTOC	DELANEY	GILMORE 1-A	2270	2275	5	2.5	W
05N-08E-31	PONTOTOC	JONES - SHELBURNE	SINCLAIR 1	2161	2170	9	3	C
05N-08E-31	PONTOTOC	JONES - SHELBURNE	SINCLAIR 1	2160	2170	10	3	C
05N-09E-21	HUGHS	DELANEY	KINNIE MAY PARKER 1	2711	2726	15	2.5	C



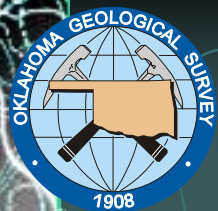
Booch Core Analysis Database

API Number	Date	Operator	Lease	Well #	QQ	Sec	Twn	T-Dir	Rng	R-Dir
35123000150000	10/1956	Buffalo Oil CO.	Mayer	1	NE SE	14	3	N	7	E
35123024840000	01/1949	Sunray Oil Corporation	Hyde Shields	4	(NE SW)	33	5	N	8	E
35063017800000	12/1945	Ashland Oil & Refining Company	Eckles	4-A	(SE NE)	21	6	N	8	E
	04/1954	Davis Brothers	English "B"	2	SW SE	14	6	N	8	E
35063018110000	08/1946	Ashland Oil & Refining Company	Williams	7	SW SW	22	6	N	8	E
35063047730000	12/1945	Ashland Oil & Refining Company	Rogers	3	(NE SW)	27	6	N	8	E
35063021030000	09/1956	Service Drilling Company	Walker	2	SW NW	3	6	N	8	E
35063021020000	08/1956	Service Drilling Company	Cotcha	2	NW NW	3	6	N	8	E
35063016700000	11/1949	Coronado Oil Company (WARREN & BRADSHAW)	White	1	(NW NE)	15	6	N	9	E
35063017780000	12/1945	Ashland Oil & Refining Company	Eckles	6-A	(NE SE)	21	6	N	8	E
	11/1944	Ashland Oil & Refining Company	Tiger	1	NE NW	27	6	N	8	E
35063003440000	12/1956	Olin Oil & Gas Corporation	Bilby	1	NW SE	7	6	N	9	E
35063019600000	07/1962	Hallam, Loren V.	Eckles (DELANEY W A JR)	5	C SE	16	6	N	8	E
35063018120000	08/1946	Ashland Oil & Refining Company	Williams	8	(SE SW)	22	6	N	8	E
35063020460000	10/1952	Consolidated-Vultee Aircraft Core	E. G. Merriman	1	SW NW	14	6	N	9	E
35063001570000	01/1947	Mid-Continent Petroleum Corporation	Thompson	1	(NW SW)	11	6	N	8	E
	01/1954	Winona Oil Company of Delaware	Campbell	3		20	7	N	8	E
35133115330000	05/1954	Winona Oil Company of Delaware	Sam King	1	NW NW	29	7	N	8	E
35133115270000	06/1953	Winona Oil Company of Delaware	Born	26	(NW NW)	20	7	N	8	E
35063027180000	12/1956	Winona Oil Company of Delaware	F. L. Warren	1	SE NW	29	7	N	8	E
35063025830000	04/1959	Davis, Earl A.	Spence	3	SE SW	17	7	N	8	E



.....Booch Core Analysis Database

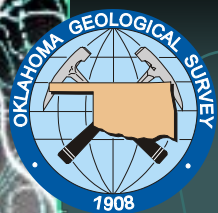
County	Fm	Top	Bot	Feet (Total)	# Samples	Fiche #
Pontotoc	Booch	481.7	490	8.1	8	344
Pontotoc	Booch	2123	2,128	5	5	2050A
Hughes	Booch	2628	2,647	19	15	61
Hughes	Booch	2646	2,677	31.4	20	552
Hughes	Booch Upper	2438	2,456	18	4	63
Hughes	Booch	2642	2,671	29	18	63
Hughes	Booch	2747	2,760	13	13	1895
Hughes	Booch	2735	2,757	22	19	1889
Hughes	Booch	2844	2,854	10	2	514
Hughes	Booch	2617	2,645	28	13	61
Hughes	Booch	2593	2,608	15	6	63
Hughes	Booch	2740	2,766	26	8	1637
Hughes	Booch	2649	2,676	27	16	826
Hughes	Booch	2453	2,466	13	2	63
Hughes	Booch	2916	2,922	6	5	419



.....Booch Core Analysis Database

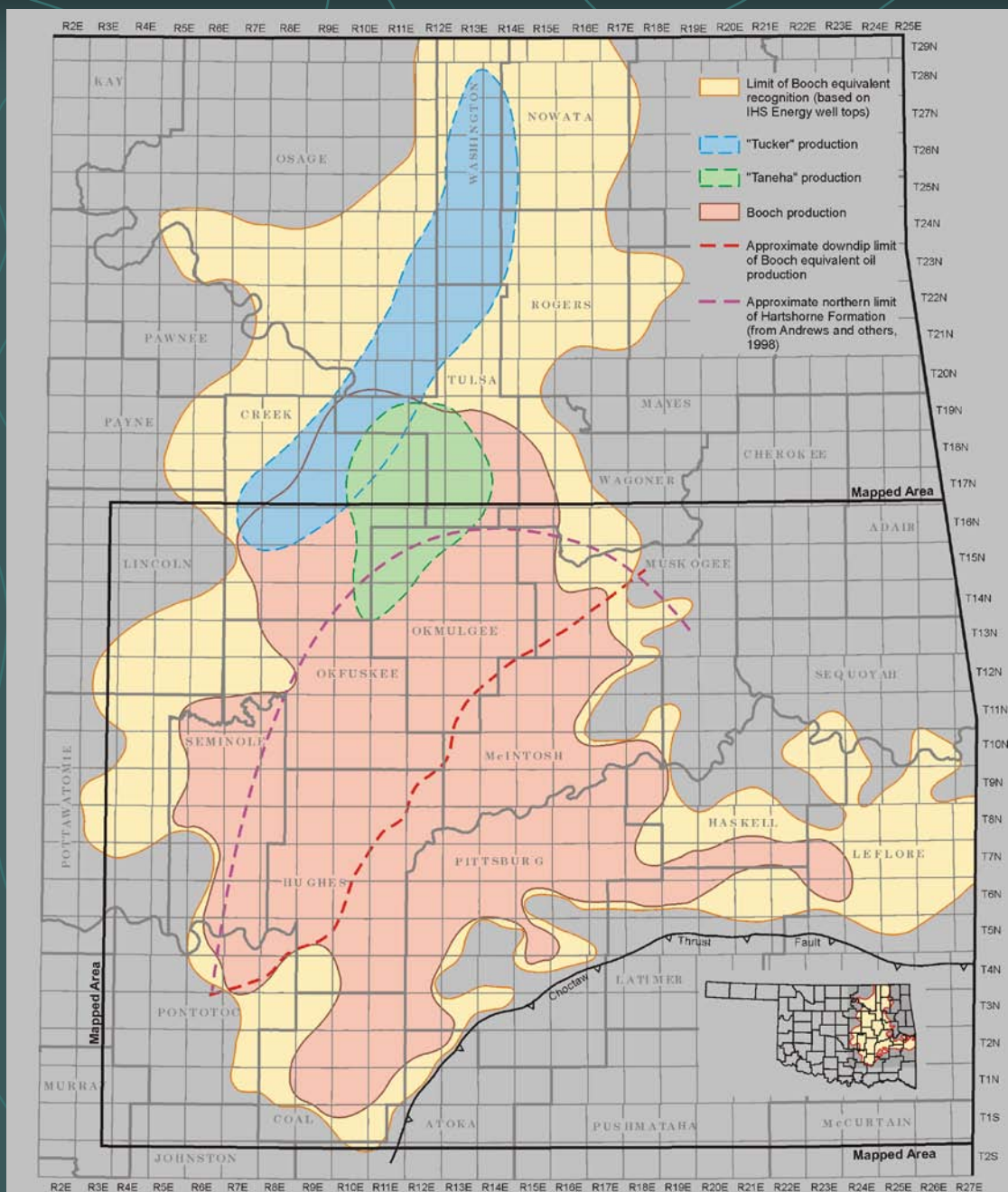
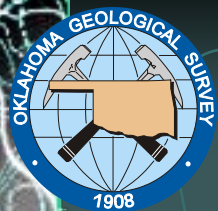
Tabulated Values (in sand only)

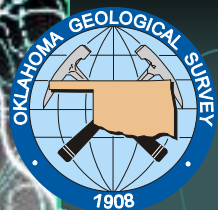
Avg Por (%)	Max Por (%)	Avg Sw (%)	Perm to water	
			Avg Perm (md)	Max Perm (md)
25.4	26.8	75	23	42
18.0	21.4	28	70	80
19.4	23.6	22	58	107
15.7	21.2	31	23	35
19.0	21.2	42	19	29
16.0	21.1	29	34	196
17.3	20.4	16	47	102
16.5	19.9	19	24	79



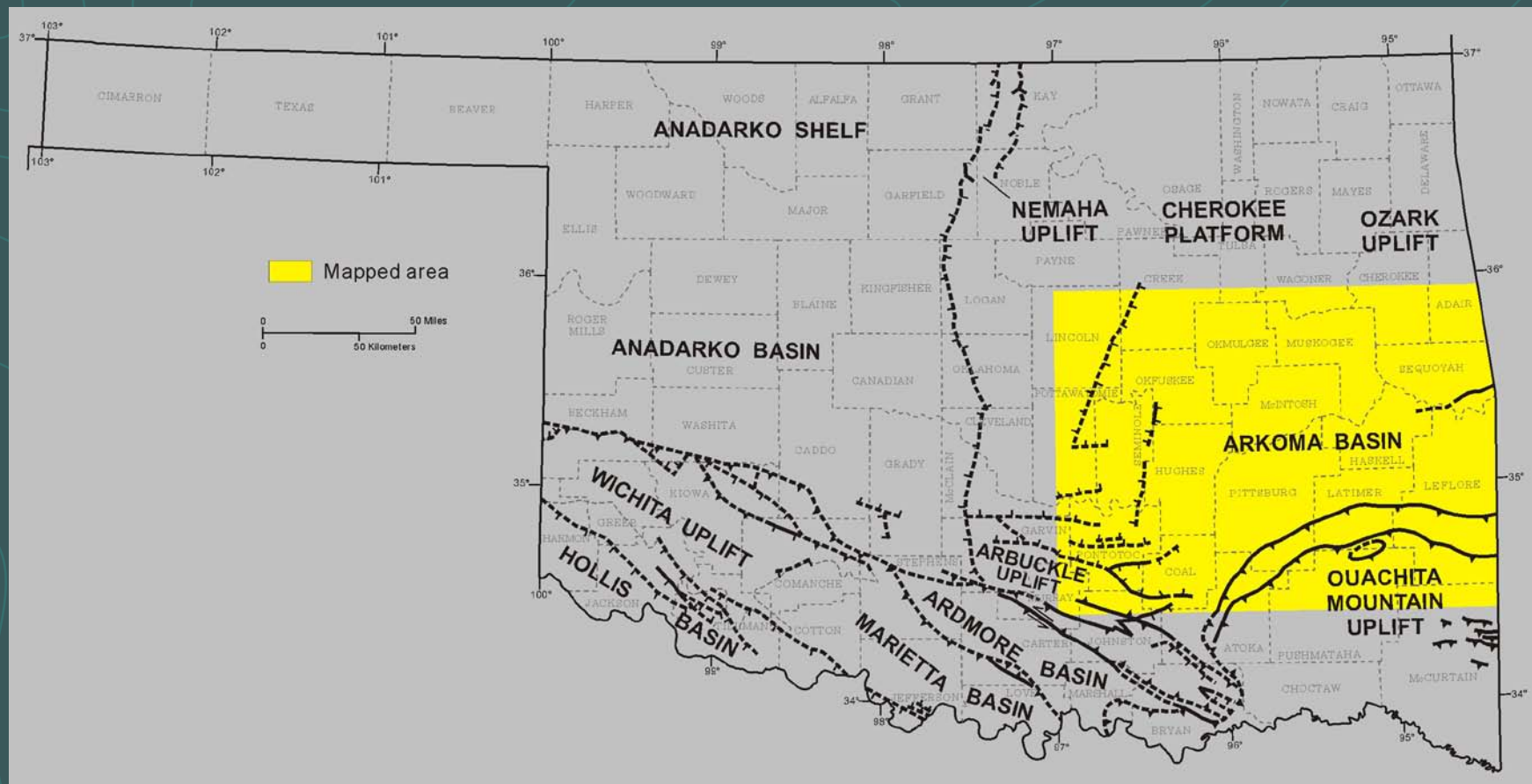
Overview - Methodology

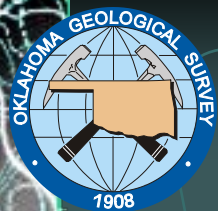
Booch-Equivalent Production



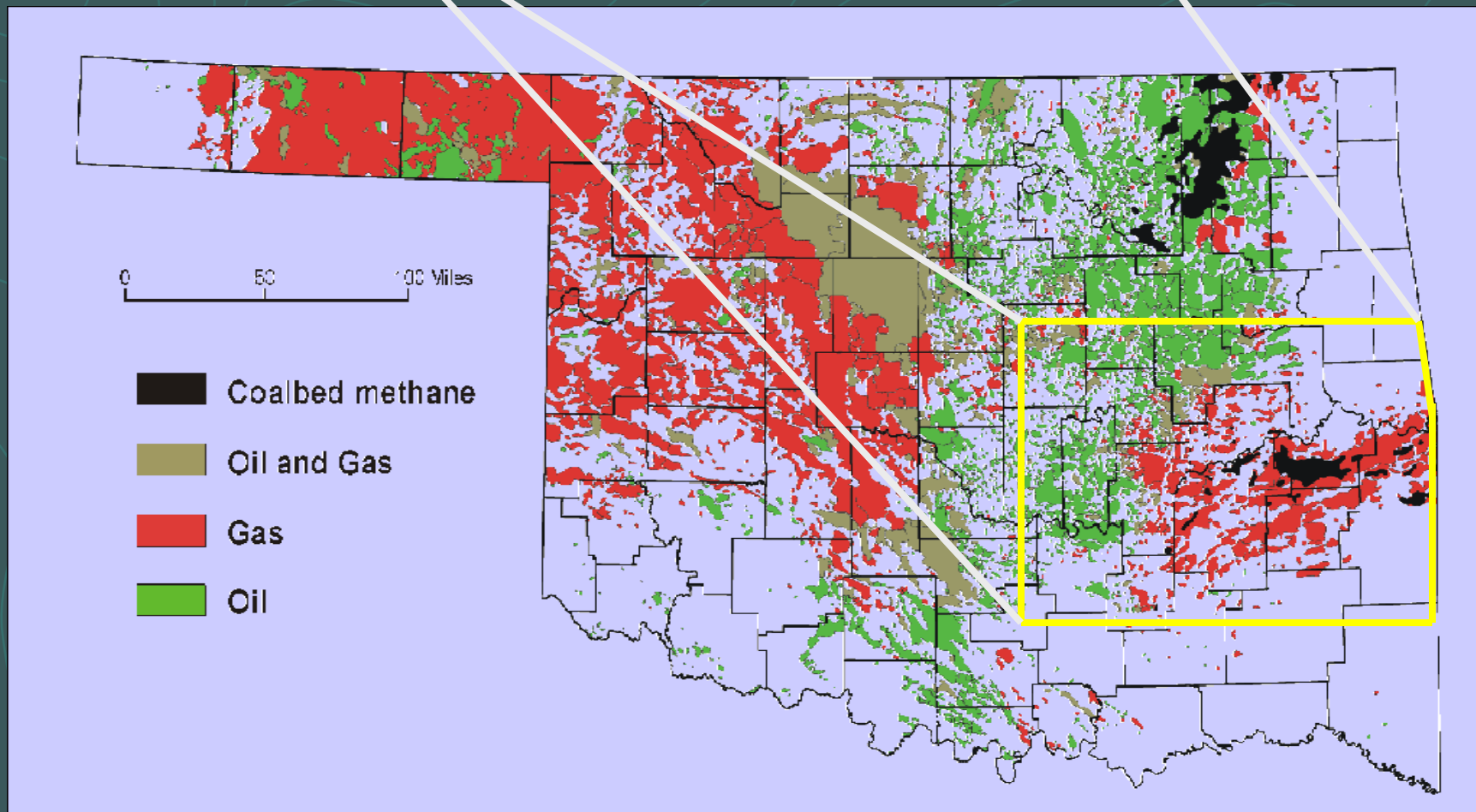


Geologic Provinces of Oklahoma



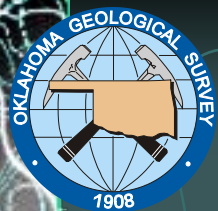


Booch Gas Play Study Area

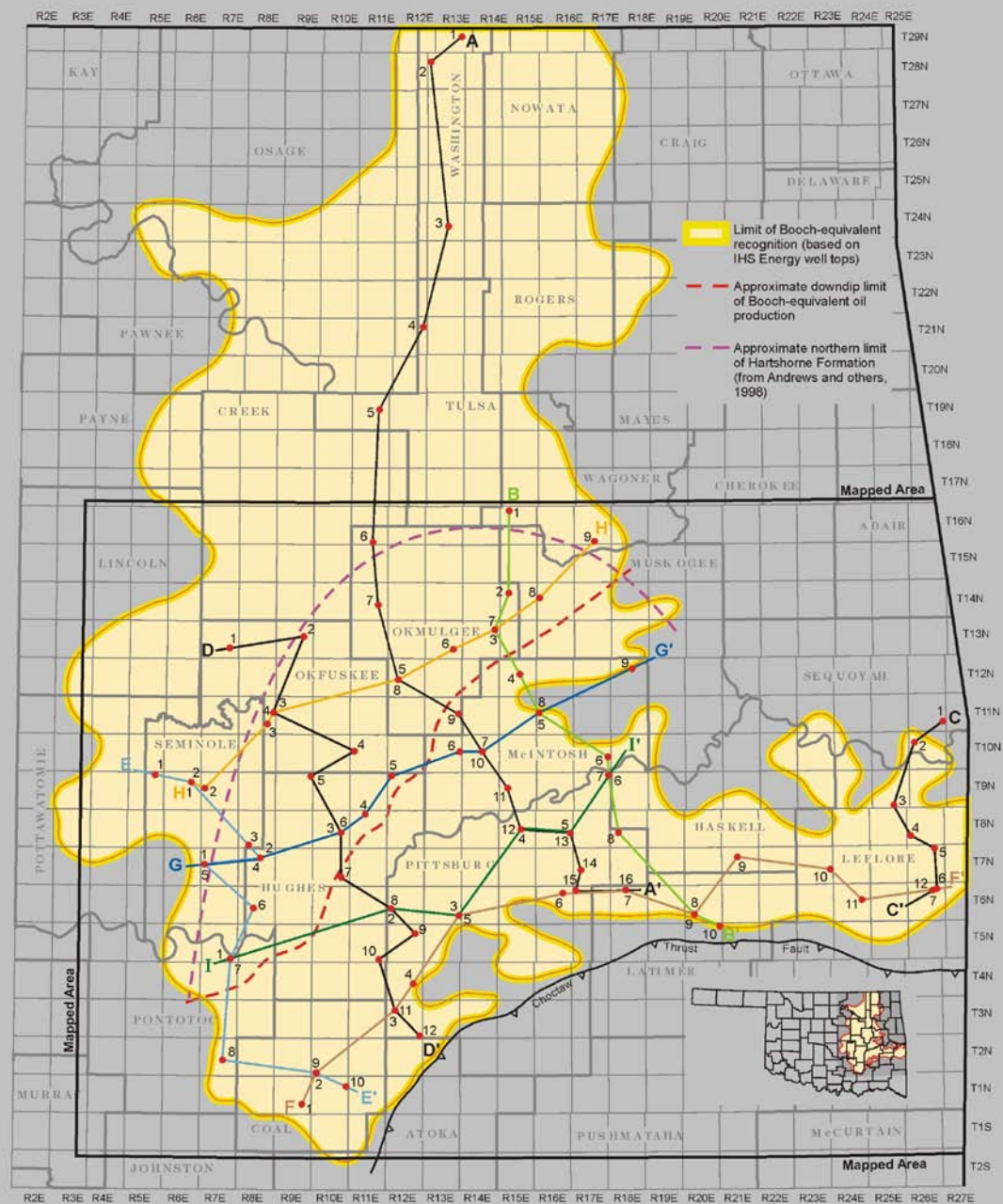


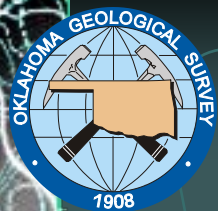
Map of Oklahoma Oil and Gas Fields; Distinguished By GOR and Coalbed Methane Production

(GOR Cutoffs: Oil <5,000; Oil and Gas 5,000-20,000; Gas > 20,000)

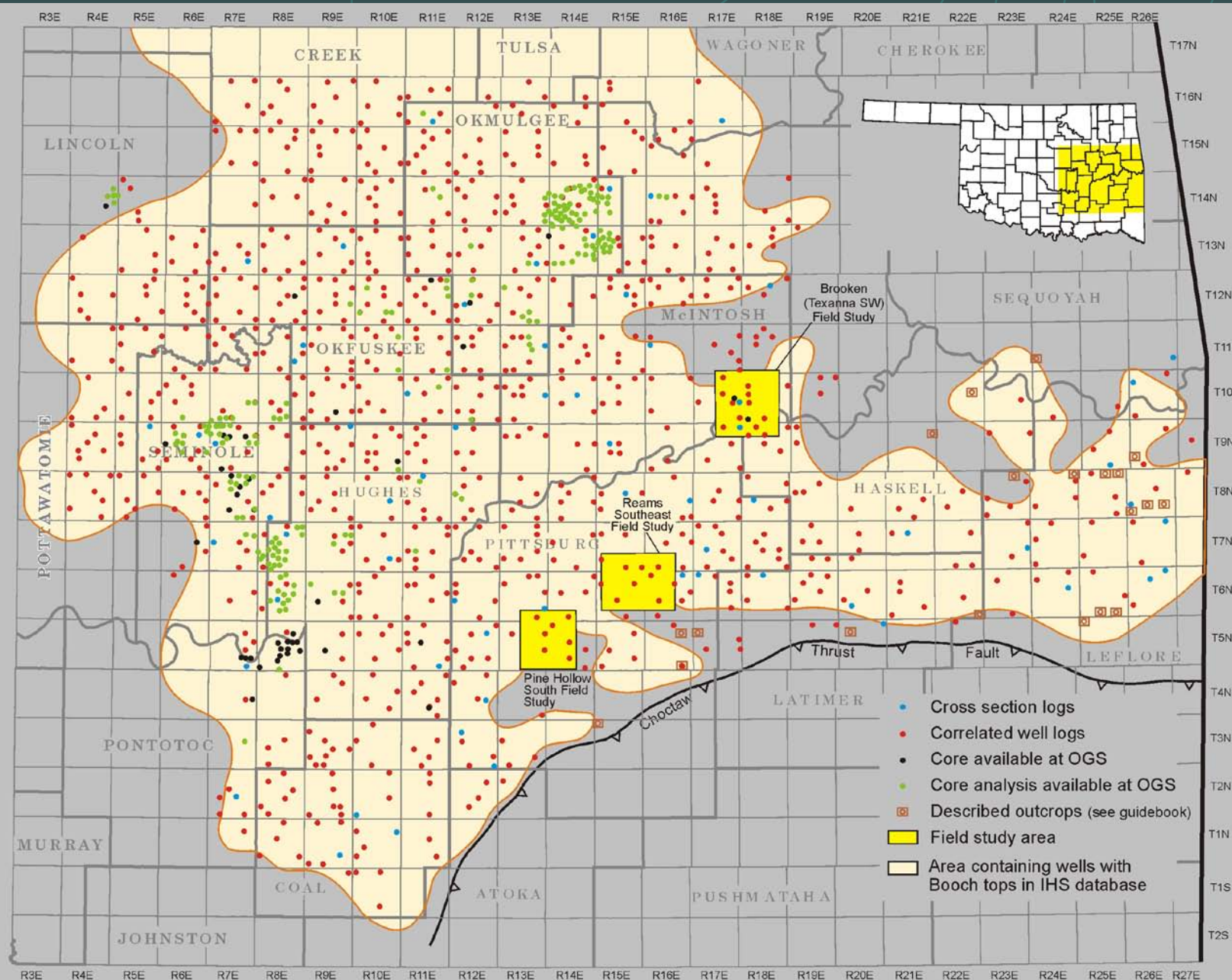


Regional Cross-Sections





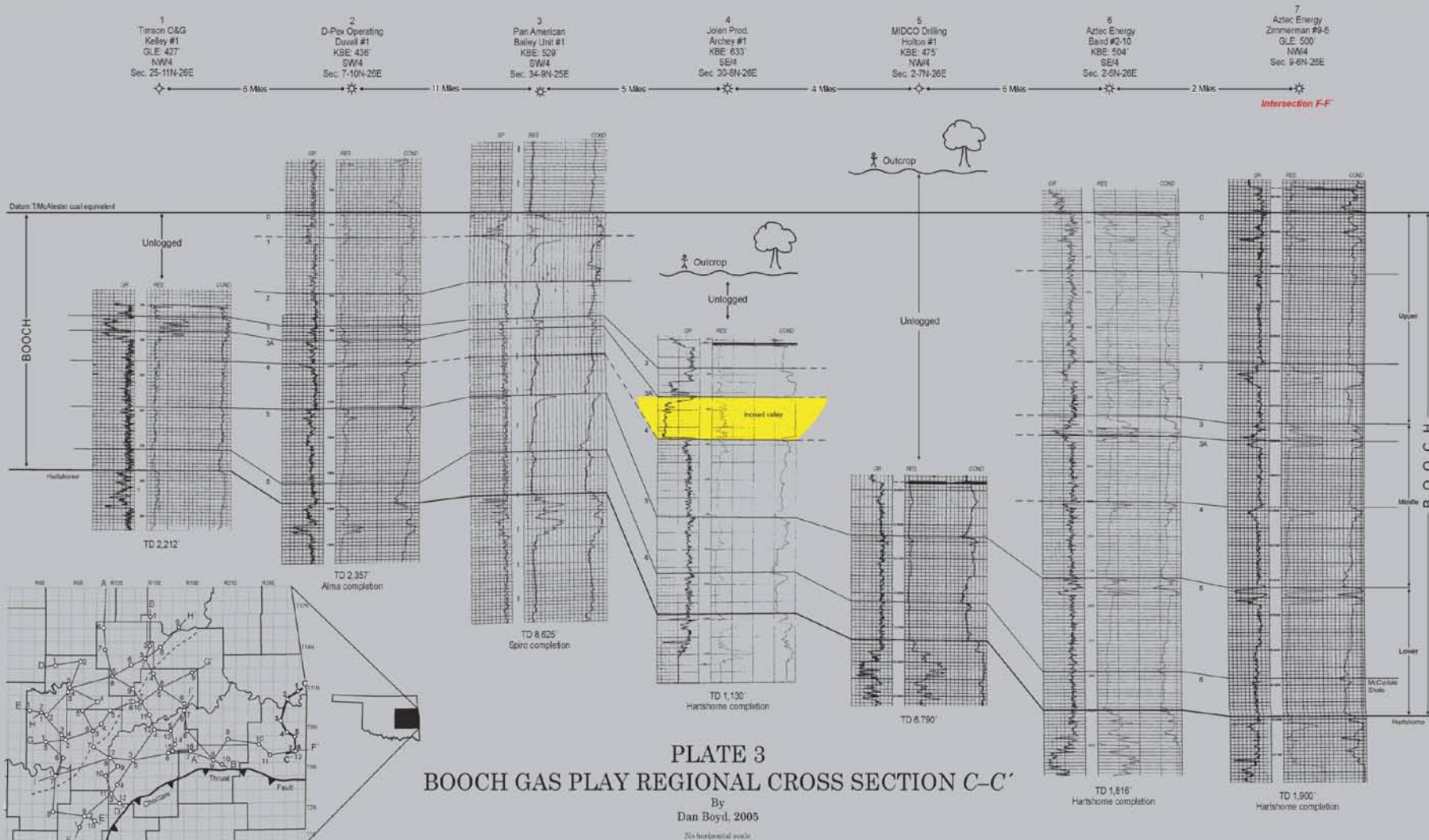
Regional Data Input

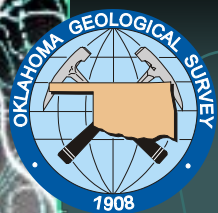


OKLAHOMA GEOLOGICAL SURVEY
Charles J. Mankin, *Director*

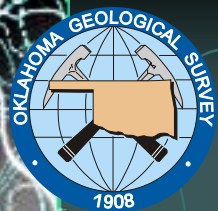
SP 2005-1, PLATE 3 of 16
Booth Gas Play Regional Cross Section C-C'

C'
South

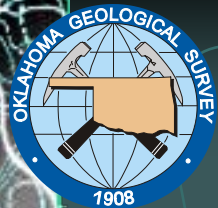




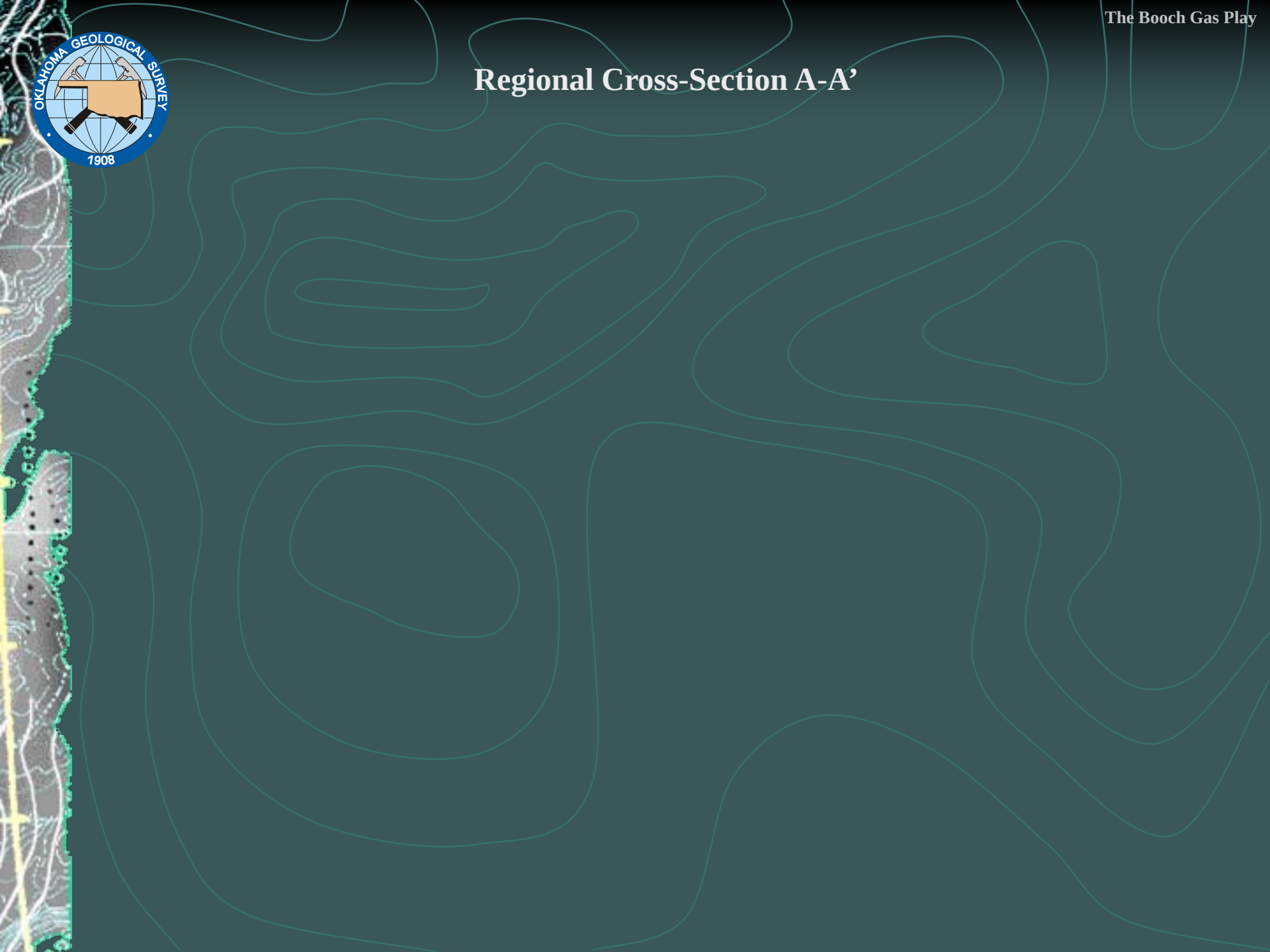
Stratigraphic Framework

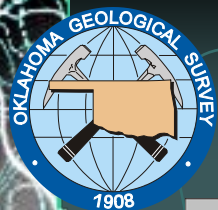


Regional Cross-Section D-D'

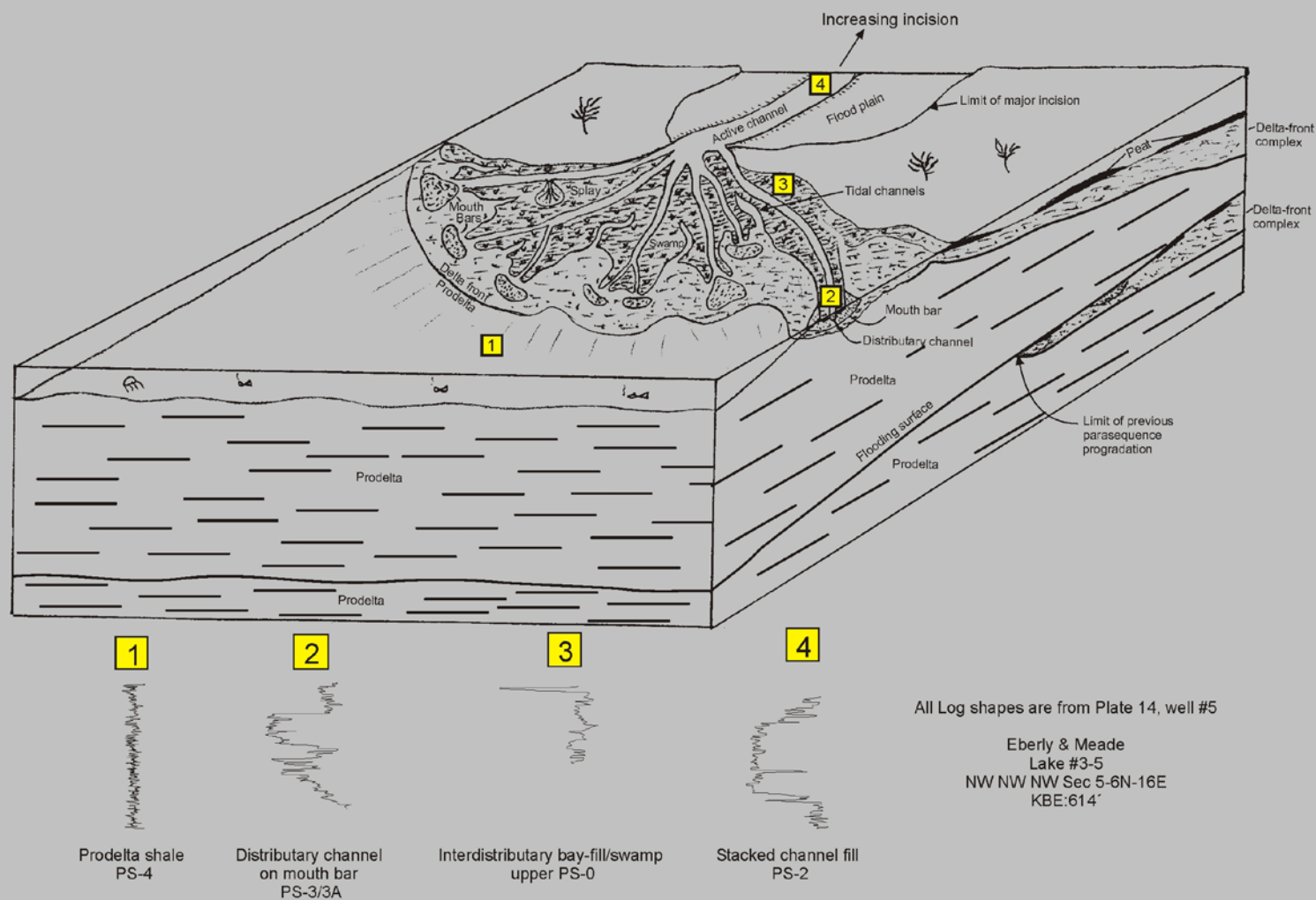


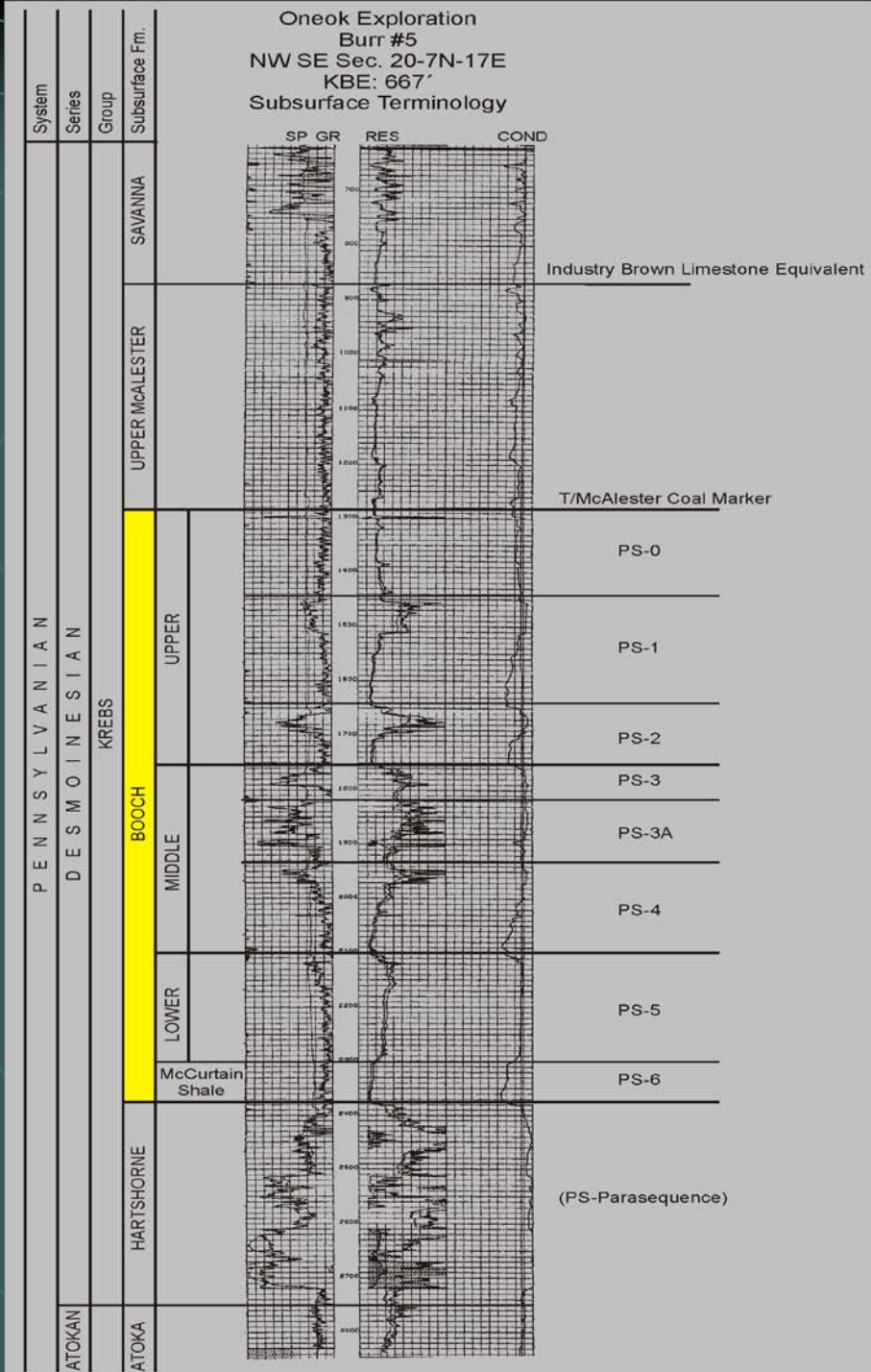
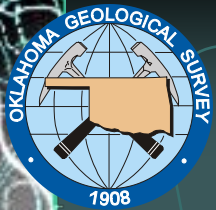
Regional Cross-Section A-A'



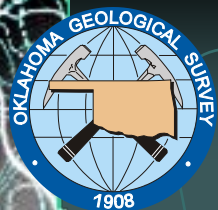


Idealized Booch Tidal Delta





Booch Type Log



Booch Stratigraphic Nomenclature

P E N N S Y L V A N I A N					SYSTEM
D E S M O I N E S I A N					SERIES
K R E B S					GROUP
M C A L E S T E R					C A B A N I S S
M C A L E S T E R					T H U R M A N
M C A L E S T E R					B O G G Y
M C A L E S T E R					S A V A N N A
M C A L E S T E R					
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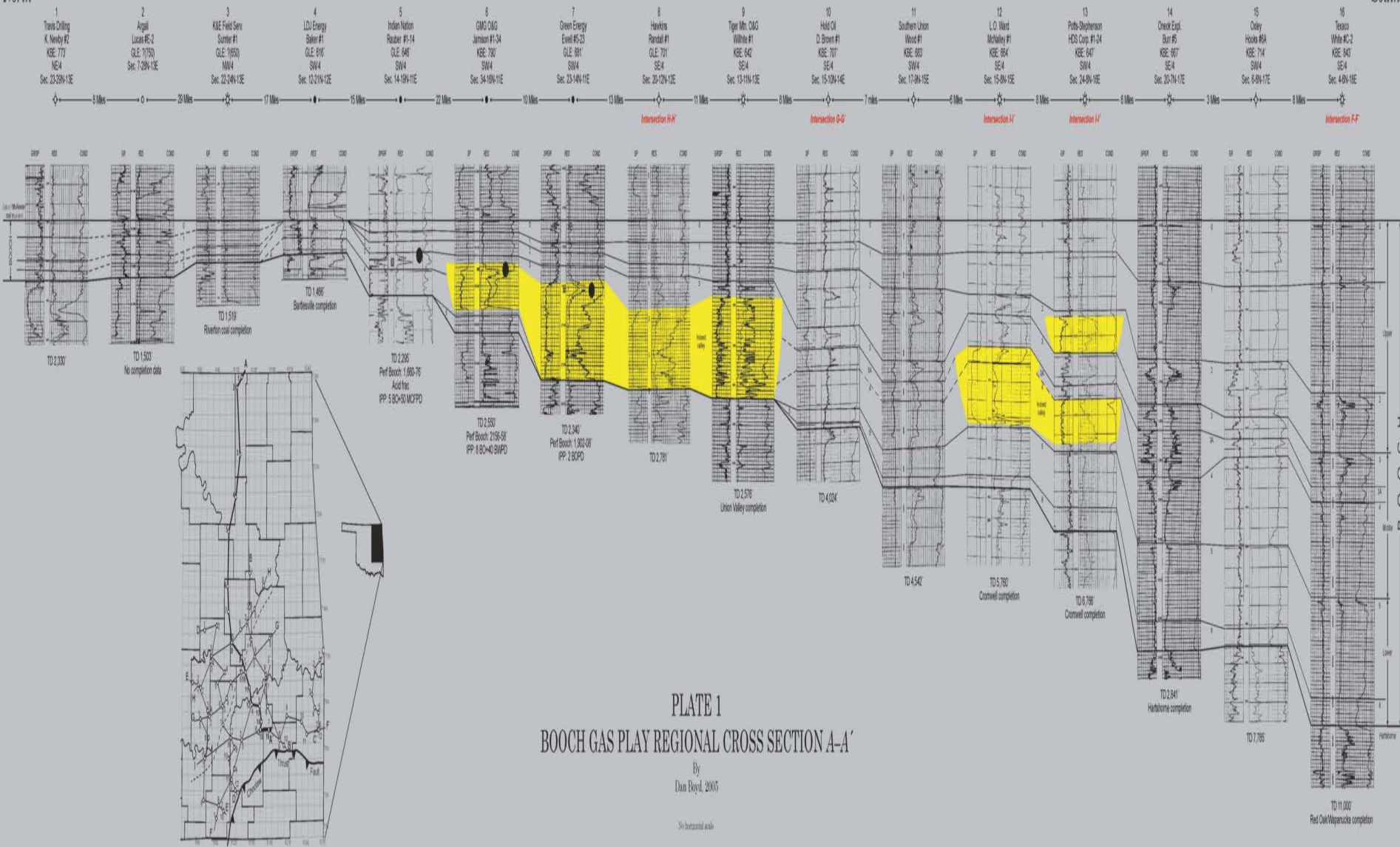


Booch Regional Cross-Section A-A'

SP 2005-1, PLATE 1 of 16
Booch Gas Play Regional Cross Section A-A'

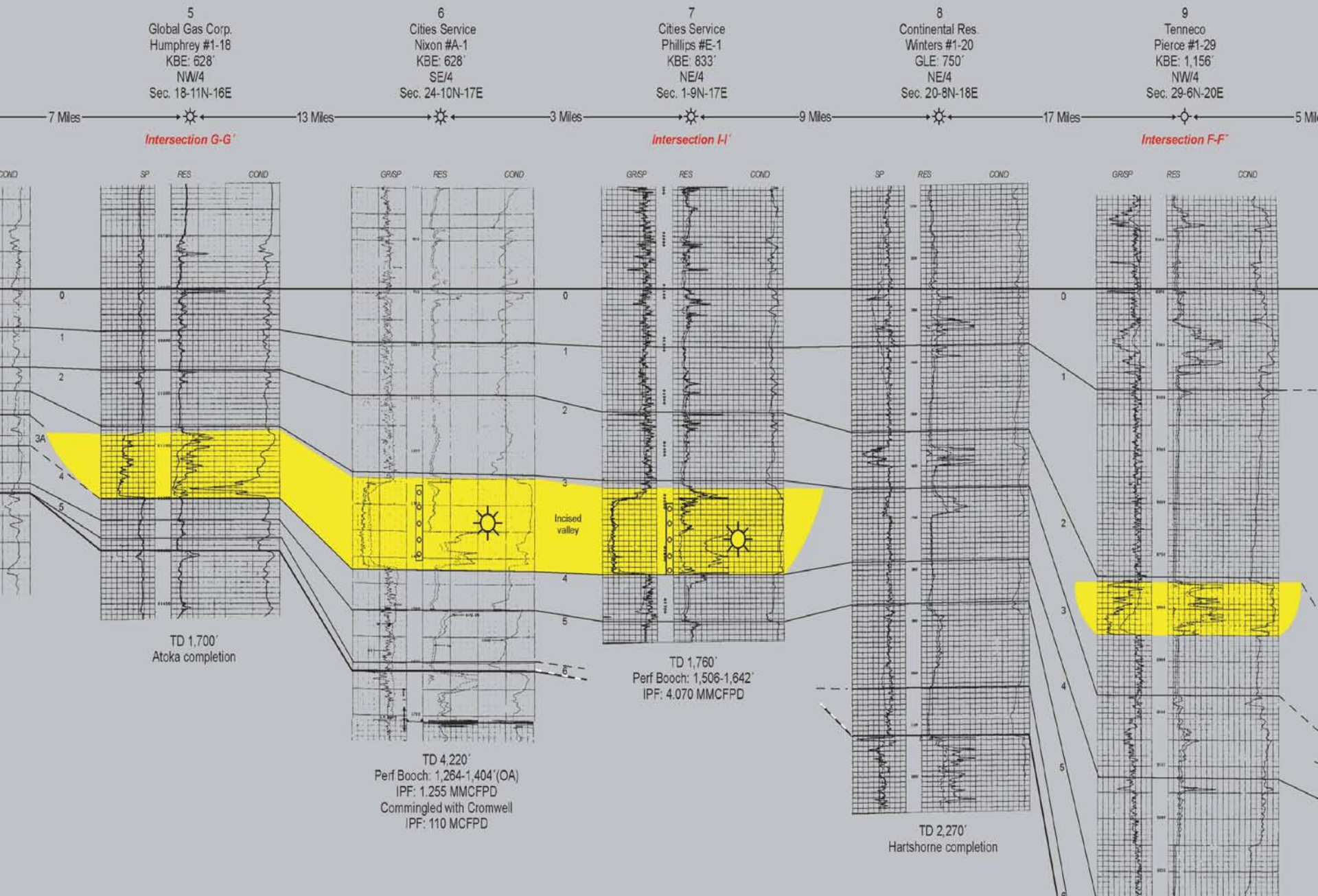
A'
South

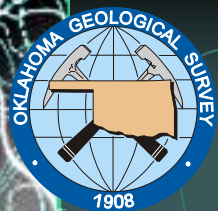
A
North



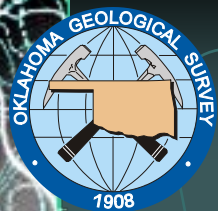


Booch Regional Cross-Section B-B'

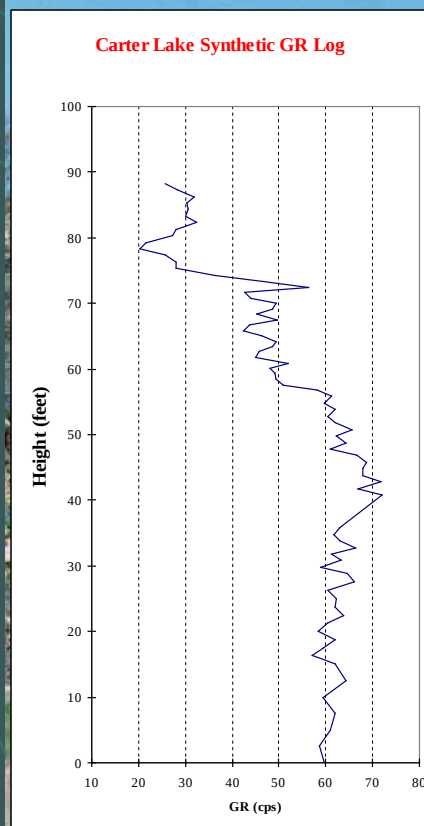


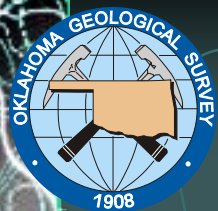


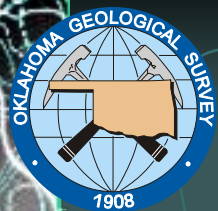
**Adamson Outcrop
PS-1 (Cameron)**



Carter Lake Outcrop PS-3 (Warner)



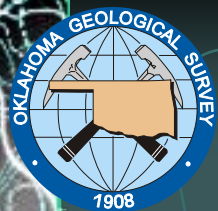


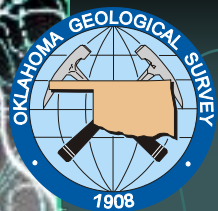


McKee #B-1
1,345'



1 inch



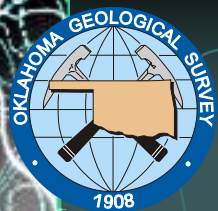


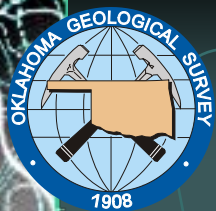
McKee #B-1
1,330'



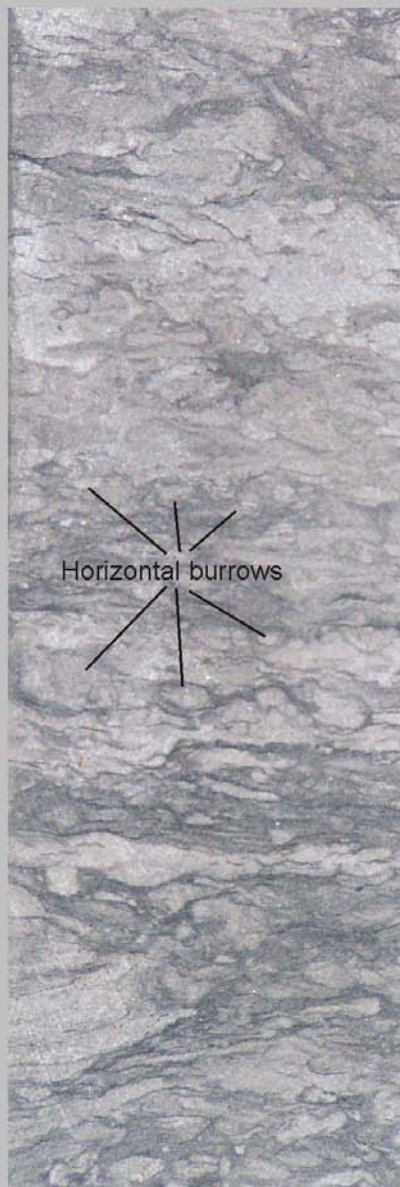
Horizontal
burrows

1 inch

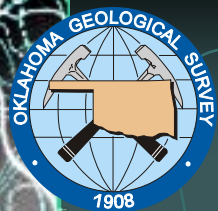


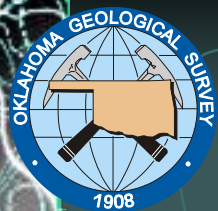


McKee #B-1
1,327'

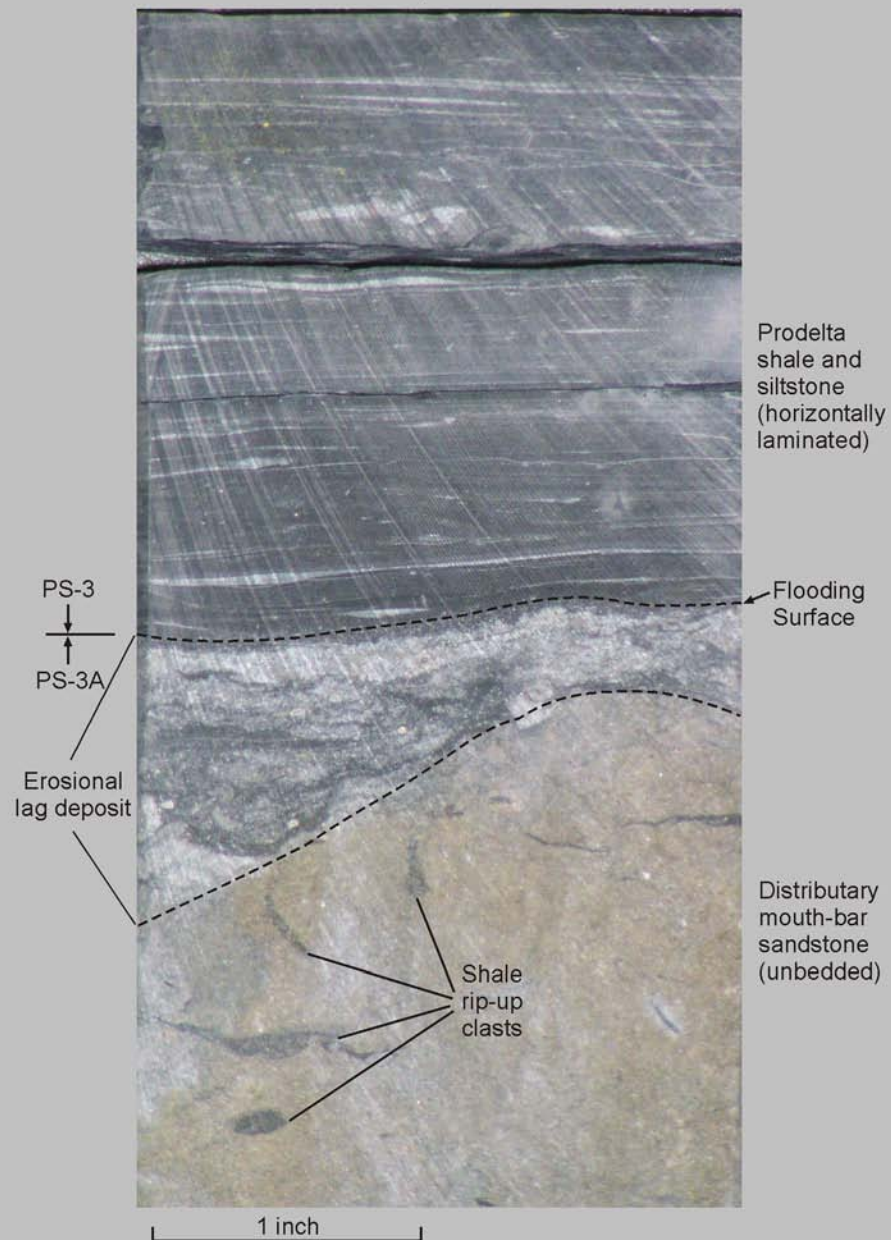


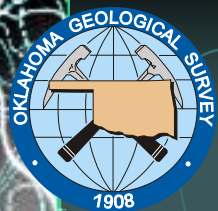
1 inch

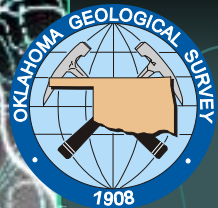




McKee #B-1
1,319'





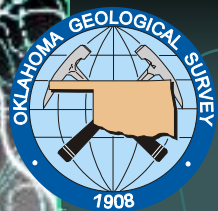


McKee #B-1
1,284'



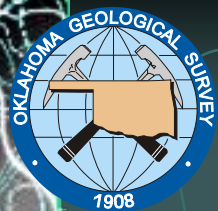
1 inch

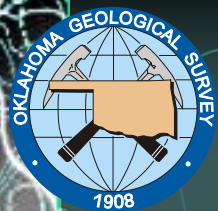
← Current
directions



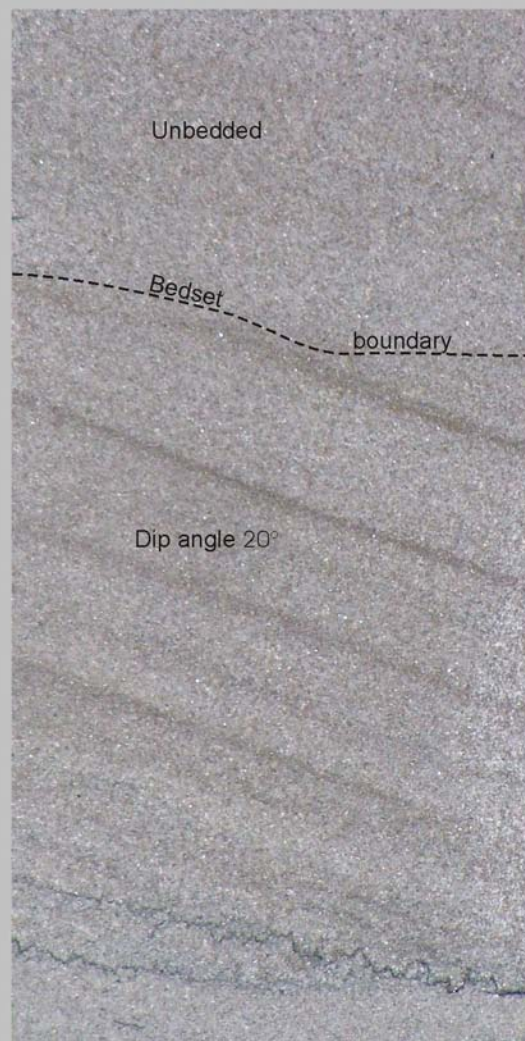
Wildhorse Mountain Outcrop



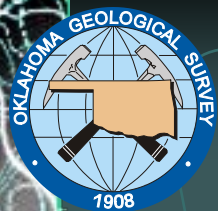


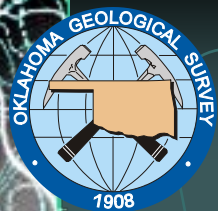


McKee #B-1
1,268'

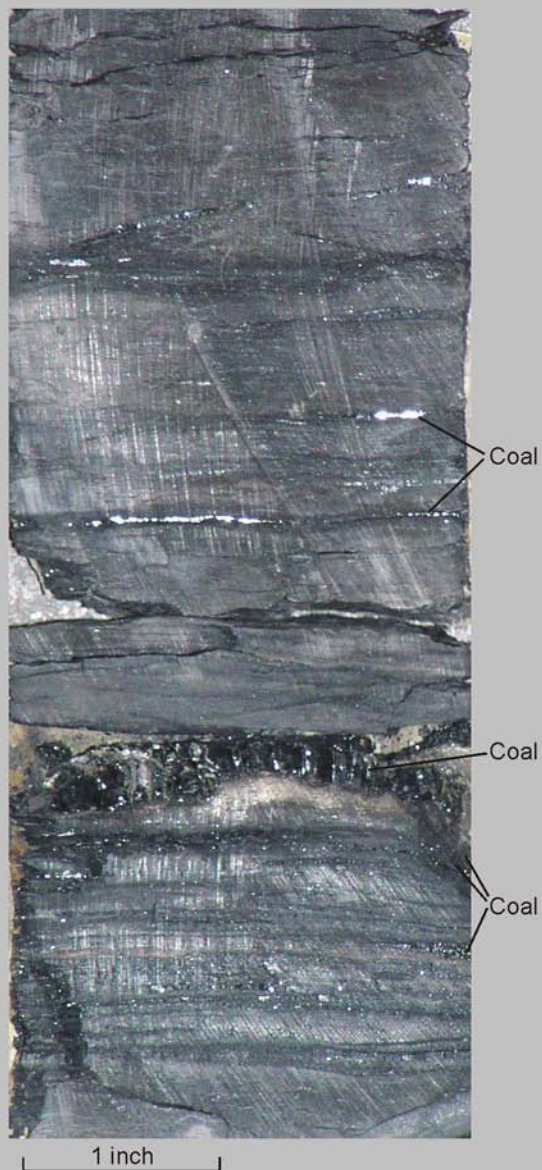


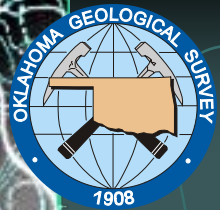
1 inch





McKee #B-1
1,257'





**Haileyville Railroad Outcrop
PS-3 (Warner)**