

Gothic / Hovenweep Shale Play Opportunity

UTE MOUNTAIN UTE RESERVATION

COLORADO



GOTHIC / HOVENWEEP SHALE PLAY OPPORTUNITY ON THE UTE MOUNTAIN UTE INDIAN RESERVATION, COLORADO

Play Highlights and Terms

The Ute Mountain Ute Tribe is offering an opportunity to explore and develop Gothic Shale / Hovenweep Shale plays on Indian lands with demonstrated potential just north of the reservation.

PLAY HIGHLIGHTS

- ACREAGE: Thousands of contiguous acres under one land owner.
 - 100% Tribal mineral and surface lands
 - Close proximity to San Juan Basin pipeline infrastructure.
 - Bill Barrett Corp. (BBC) reports rates in the Gothic Shale ranging from 1.5 to 4.9 MMCF/D and calculates 58 BCF gas-in-place per section in the Gothic Shale based on core. Significant associated light oil (condensate) and NGL production. The western portion of the Ute Mountain Ute Reservation may be in a more oil prone region.
 - The northern border of the Ute Mountain Ute Reservation is less than fifteen miles south of Bill Barrett's successful Gothic Koskie wells (Pedro Field), and less than ten miles south of their Hovenweep test, the Gray 13-15.
 - Mapping of the Gothic and Hovenweep shale isopachs indicate thicknesses comparable to the Bill Barrett area (approximately 80 – 150 feet).
 - Isopach and structure maps of the Gothic and Hovenweep shales have been completed and can be made available to interested parties.
 - Geochemical analyses were conducted on cores obtained from the Bill Barrett Play area and the Ute Mountain Ute Reservation for both the Gothic Shale and Hovenweep Shale.
-
- Agreement will use the 1982 Indian Mineral Development Act. Refer to web site www.bia.gov/WhoWeAre/AS-IA/IEED/DEMD/WIL for sample IMDA agreements.

TERMS

- All terms, except for royalty, are subject to negotiation.
- The minimum royalty to the tribe will be 1/6 (16 2/3%).
- Exploration Blocks Size: 25,000 acres (negotiable)
- 5 year primary term

COVER PICTURE

Gothic Shale outcrop near Goosenecks
of the San Juan River, Utah

Gothic and Hovenweep Shale Play

Ute Mountain Ute Indian Reservation

COLORADO

Paula Mohseni, Petroleum Geologist

ASSISTANT SECRETARY – INDIAN AFFAIRS, DIVISION OF ENERGY AND MINERAL DEVELOPMENT

Geochemical Analysis and Interpretation by Weatherford Laboratories, 2010

Introduction

The Ute Mountain Ute Reservation is located in southwestern Colorado/northwestern New Mexico and lies within the hydrocarbon-bearing Paradox Basin (Figure 1). The Paradox Basin formed during Pennsylvanian time (Desmoinesian), approximately 330 to 310 million years ago. The basin is known for prolific oil fields, such as Aneth, which has produced over 440 million barrels of oil (Chidsey, et. al. SWII), and for natural gas production (Ute Dome cumulative gas: 6,930 MMCF and Barker Dome: cumulative gas: 4,741MMCF, IHS Energy).

These fields produce from the biogenic/bioclastic carbonate and algal mounds associated with the cycles of the Barker Creek, Akah, Desert Creek, and Ismay stages of the Pennsylvanian Paradox Formation. The organic-rich shales, including Chimney Rock, Gothic, and Hovenweep, that separate these carbonate reservoirs are thought to be the source of oil and gas (Figure 2 and 3).

Recent advances in technology and horizontal drilling now allow production from these low permeability shales, which were once thought to be too tight to produce. North of the Ute Mountain Ute Reservation, Bill Barrett Corporation (BBC) has claimed success in Gothic and Hovenweep shale-gas plays. Mapped shale thicknesses (up to 150') and geochemical comparisons indicate these prospective shales extend southward from the BBC shale play area through the Ute Mountain Ute Reservation.

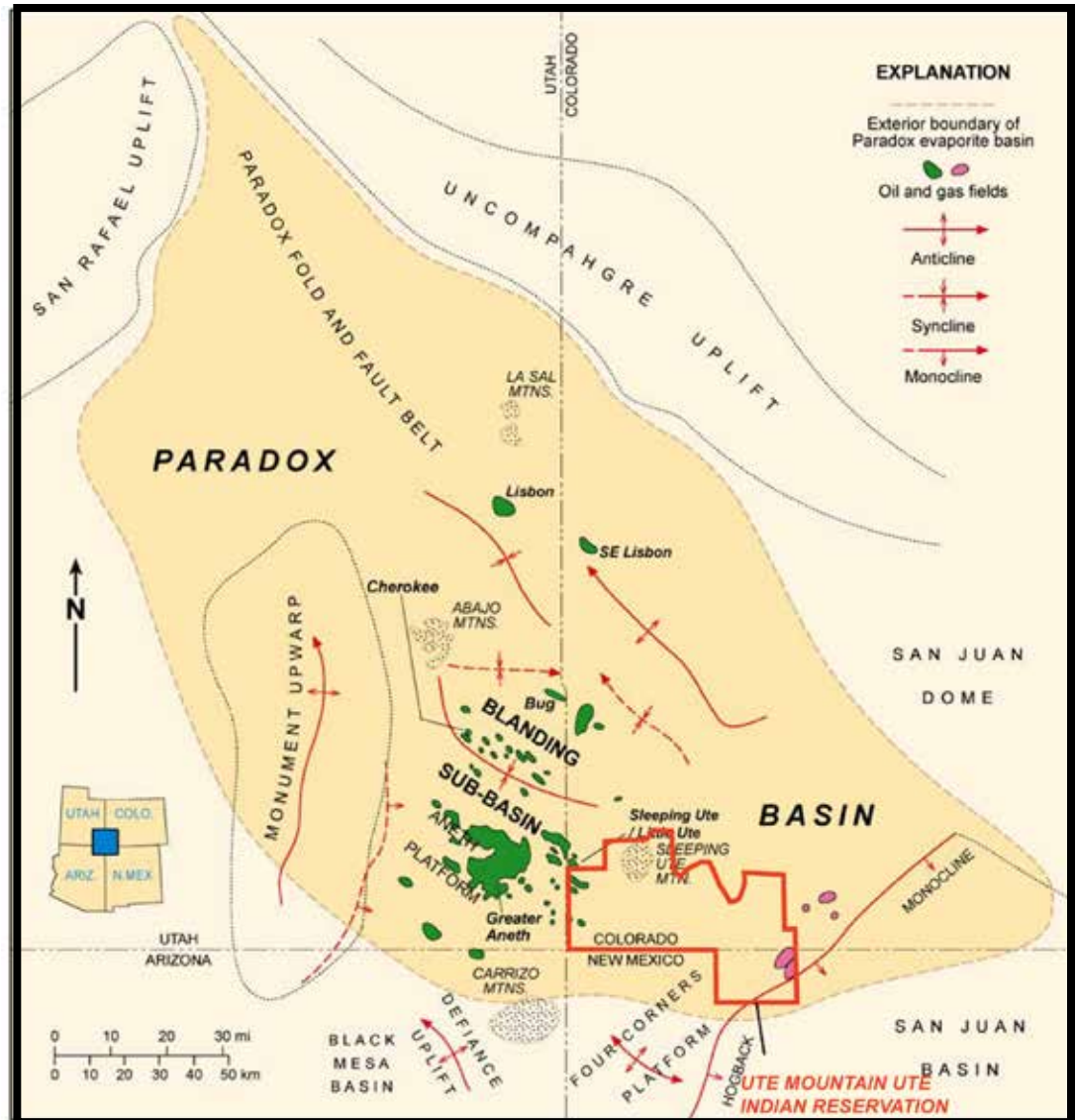


Figure 1. Location map of the Ute Mountain Ute Reservation within the Paradox Basin, Utah, Colorado, Arizona, and New Mexico showing producing oil and gas fields, the Paradox fold and fault belt, and Blanding sub-basin as well as surrounding Laramide basins and uplifts (modified from Harr, 1996).

AGE	FORMATION OR GROUP
CRETACEOUS	Mesa Verde Group (Fenton Ss. Member)
	Mancos Shale
	Dakota Sandstone
	Burno Canyon Formation
	Morrison Formation
JURASSIC	San Rafael Group
	Glen Canyon Group
TRIASSIC	Chinle Formation
	Shinarump Member
	Moenkopi Formation
	Timpoweap Member
PERMIAN	Cutter Formation
	Katiba Ls. / White Rim Ss. / De Chelly Ss.
	Organ Rock Tongue
	Cedar Mesa Sandstone
PENNSYLVANIAN	Hermosa Group
MISSISSIPPIAN	Hermosa Group
DEVONIAN	Hermosa Group
SILURIAN	Hermosa Group
ORDOVICIAN	Hermosa Group
CAMBRIAN	Hermosa Group
ARCHEAN	Igneous and metamorphic rocks

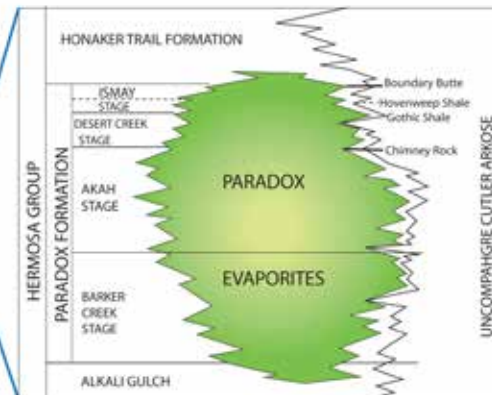


Figure 2. Stratigraphic Section of the Paradox Basin with detailed inset of the Hermosa Group, illustrating facies changes in the Paradox Formation across the basin. The stages of the Paradox Formation are bounded by time stratigraphic marker beds of sapropelic, dolomitic mud. The Gothic and Hovenweep shales represent two of these marker beds (modified from Harr, 1996).

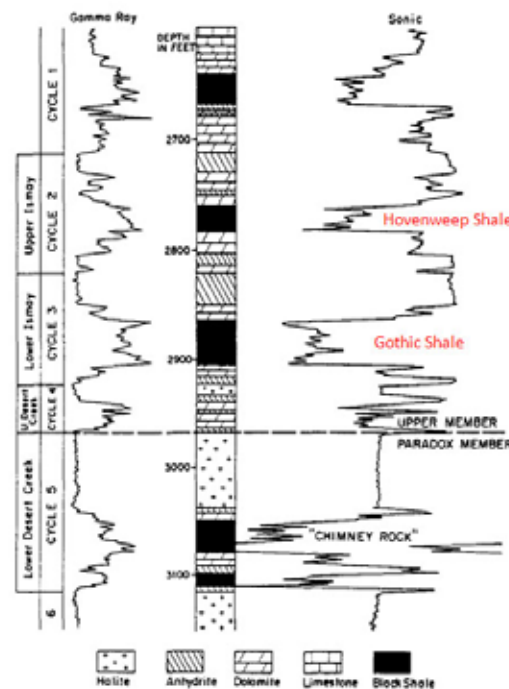


Figure 3. Type log showing lithology of the Paradox Formation (modified from Hite, R.J., Anders, D. E., and Ging, T. G., 1982).

Geologic Comparisons between the Ute Mountain Ute Reservation and Bill Barrett Corp. Area

Nine horizontal Gothic wells and one horizontal Hovenweep well (which is currently shut-in) have been drilled by the BBC just north of the Ute Mountain Ute Reservation. The northern border of the Ute Mountain Ute Reservation is less than fifteen miles south of Barrett's successful Gothic Koskie wells (designated the Pedro Field), and less than ten miles south of their Hovenweep test, the Gray 13-15.

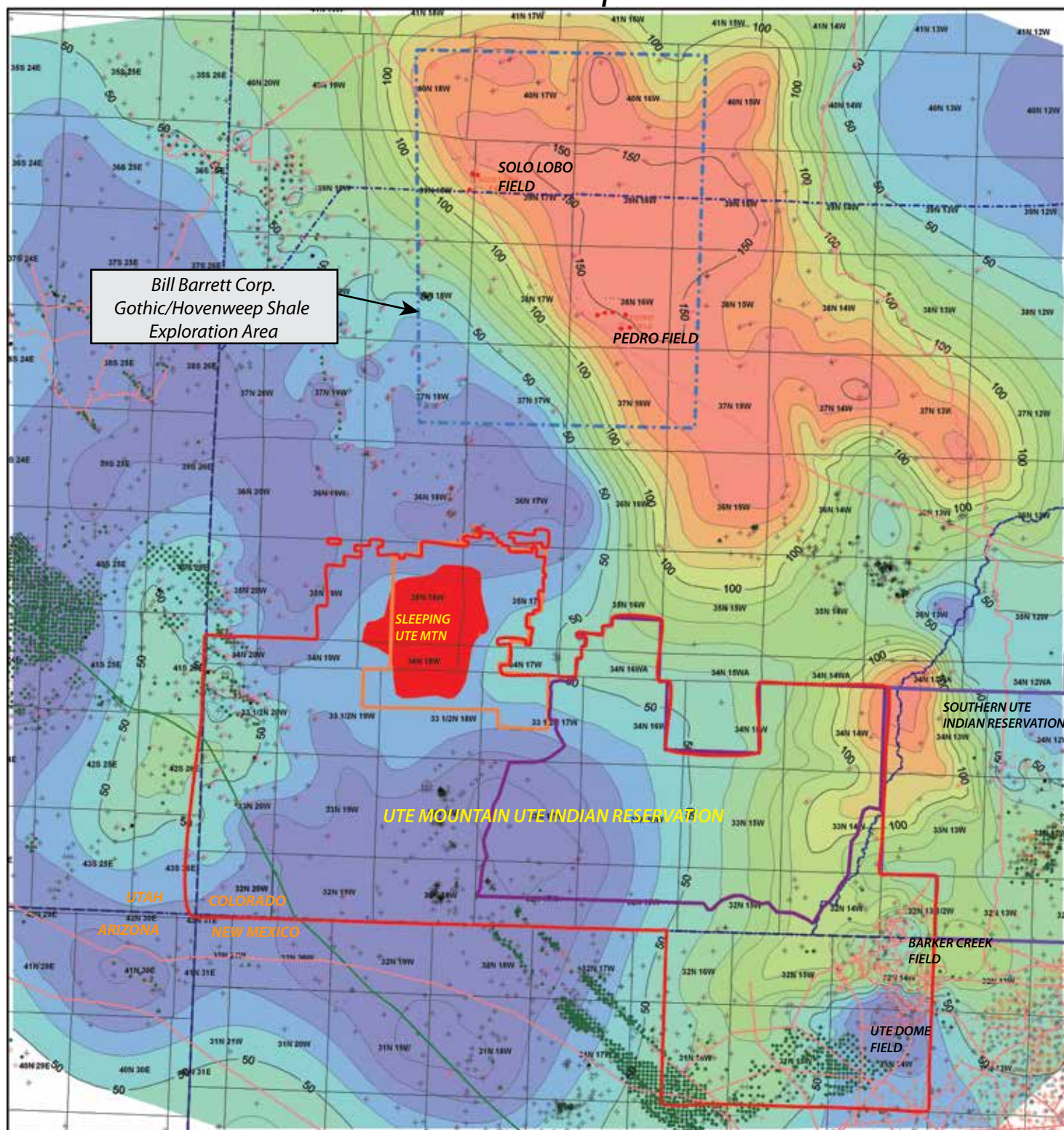
Initial production (IP) rates in the Gothic Shale range from 1.5 to 4.9 MMCF/D. Barrett calculates that there is 58 BCF gas-in-place per section in the Gothic Shale based on their core studies. Currently Barrett is working on frac design and evaluating the overall commerciality of the play (Bill Barrett Corp. conversation with P. Moreland).

Isopach maps for the Gothic and Hovenweep shales (Figures 4 and 5, respectively) indicate comparable thicknesses for the two areas. A structure map of the Gothic Shale (Figure 6) indicates the Gothic is structurally deeper in the Ute Mountain Ute area. The average measured depth for a horizontal well in the BBC area is 9,100'. Laterals range from 2,700' to 4,100' (Bill Barrett Corp., conversation with P. Moreland). Table 1 compares the Gothic and Hovenweep shale thicknesses and true vertical drilling depths of the Barrett area and the Ute Mountain Ute Reservation. The Gothic Shale trends southeast from the Bill Barrett Play area through the eastern portion of Ute Mountain Ute Reservation. A localized thickened section, up to 60 feet thick, is located along the western margin of Ute Mountain Ute Reservation. The Hovenweep thick lies west of that of the Gothic and trends through the central portion of the reservation.

	Thickness (ft) Barrett Area	Thickness (ft) Ute Mountain Ute Reservation	TVD Depth (ft) Barrett Area	TVD Depth (ft) Ute Mountain Ute Reservation
GOthic	80-150 ft	80-140 ft.	5,500-5900 FT	5,800-8,850
HOVENWEEP	80-110 ft	80-110 ft.	5,500-7,500	5,900-8,100

TABLE 1. Gothic and Hovenweep shale thicknesses and drilling depths for the Bill Barrett Corp. area and the Ute Mountain Ute Reservation

Gothic Shale Isopach



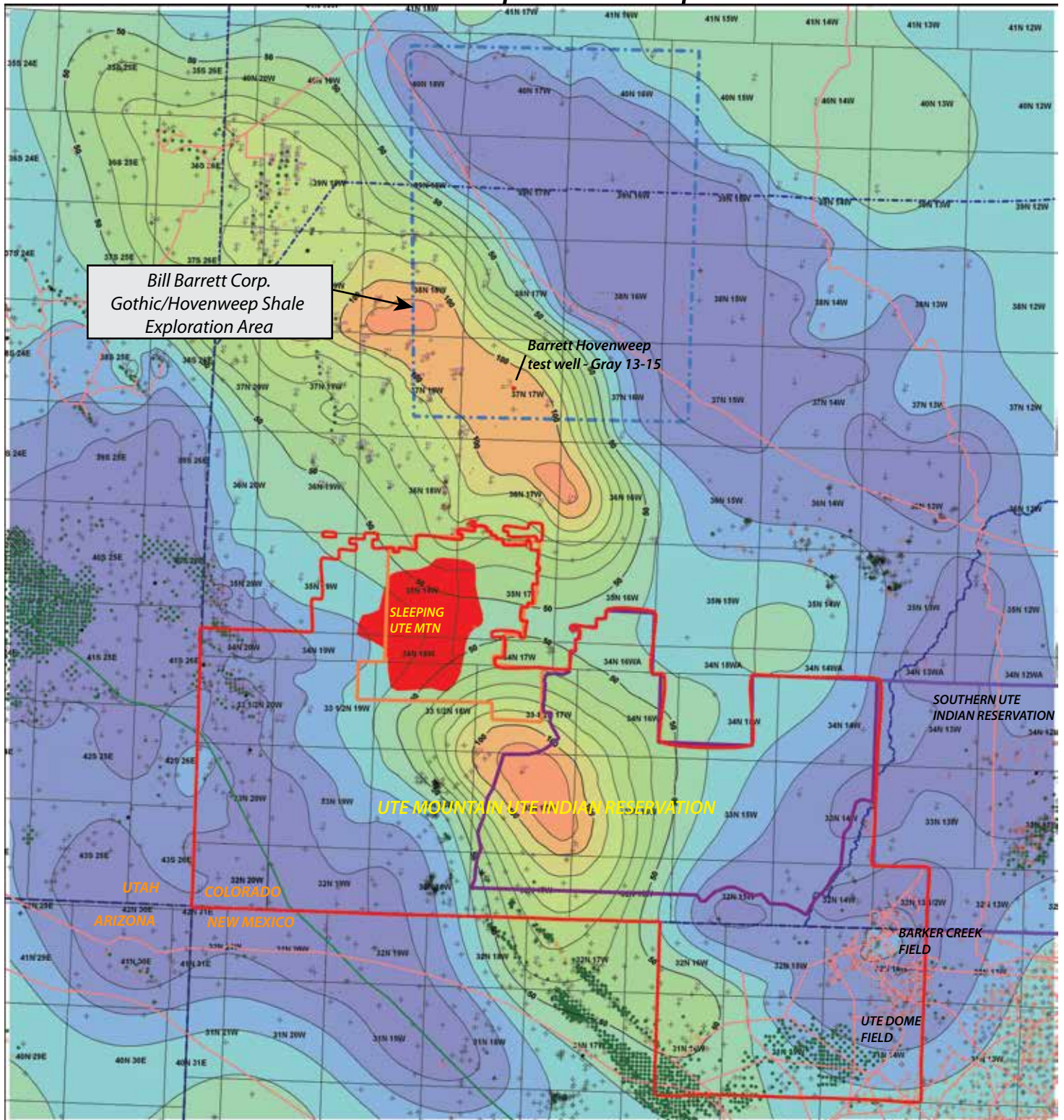
- Ute Mountain Ute Reservation Boundary
- Tribal Park Boundary
- Sleeping Ute Mountain - restricted area
- Natural Gas Pipeline
- Crude Oil Pipeline

Paula Mohseni
OCTOBER, 2010

C.I. = 10 ft

Figure 4. Gothic shale isopach map showing the locations of the Bill Barrett Corp. Gothic/Hovenweep shale exploration area and Gothic shale isopach thicks in and around the Ute Mountain Ute Indian Reservation.

Hovenweep Shale Isopach



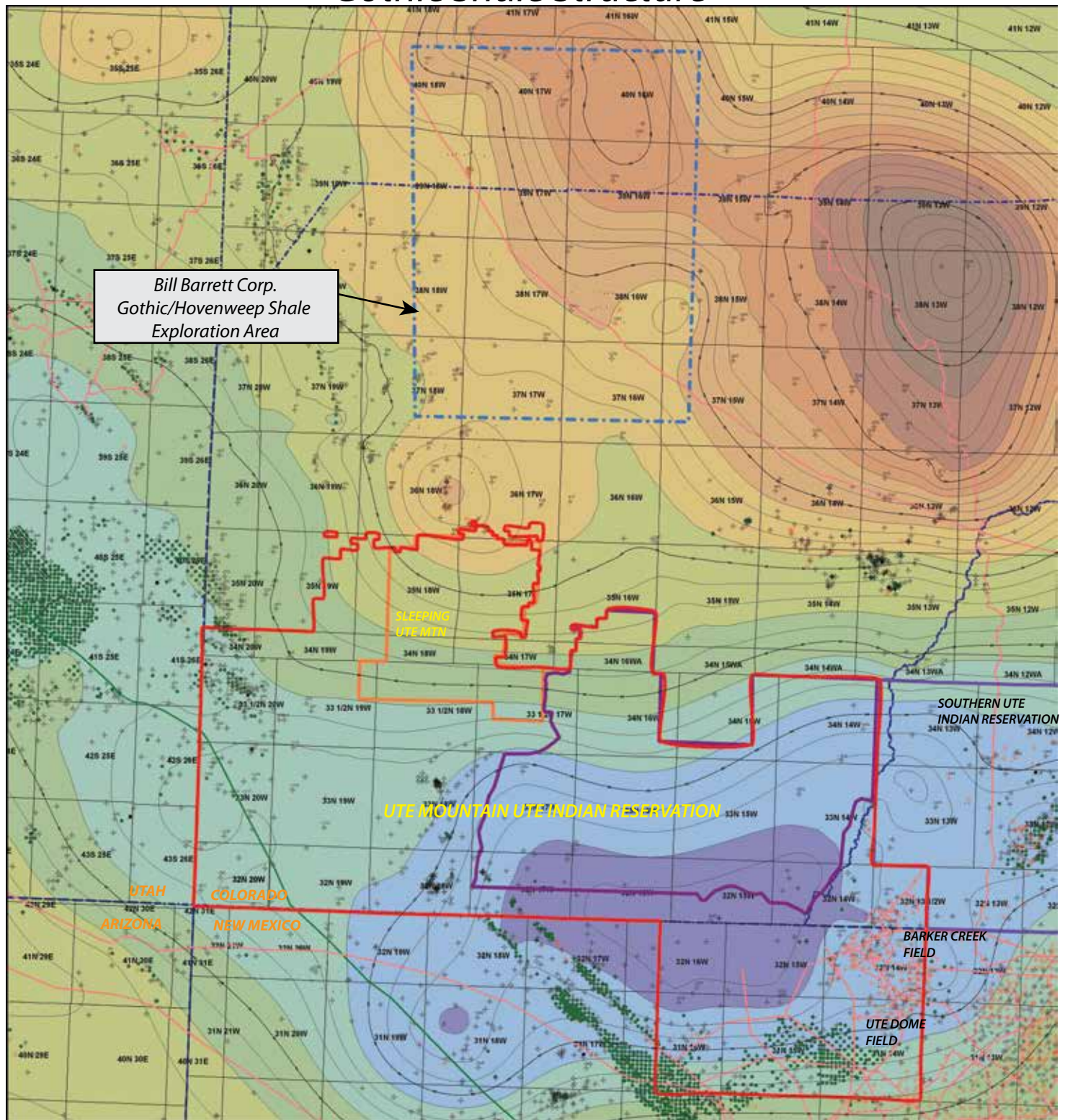
- Ute Mountain Ute Reservation Boundary
- Tribal Park Boundary
- Sleeping Ute Mountain - restricted area
- Natural Gas Pipeline
- Crude Oil Pipeline

Paula Mohseni
OCTOBER, 2010

C.I. = 10 ft

Figure 5. Hovenweep shale isopach map showing the locations of the Bill Barrett Corp. Gothic/Hovenweep shale exploration area and Hovenweep shale isopach thicks within the Ute Mountain Ute Indian Reservation.

Gothic Shale Structure



- Ute Mountain Ute Reservation Boundary
- Tribal Park Boundary
- Sleeping Ute Mountain - restricted area

- Natural Gas Pipeline
- Crude Oil Pipeline

Paula Mohseni
OCTOBER, 2010

C.I. = 200 ft

Figure 6. Gothic shale structure map showing the locations of the Bill Barrett Corp. Gothic / Hovenweep shale exploration area and the Ute Mountain Ute Indian Reservation.

Geochemical Evaluation

Geochemical analyses were conducted on cores obtained from the Barrett Play area and the Ute Mountain Ute Reservation for both the Gothic Shale and Hovenweep Shale. For the Gothic Shale two core samples were selected from the Barrett area and three core samples were obtained from the Ute Mountain Ute Reservation. For the Hovenweep Shale, one core sample was selected from the Barrett area and two core chip samples were obtained on the Ute Mountain Ute Reservation.

Weatherford Laboratories performed the geochemical analyses, including programmed pyrolysis hydrocarbon yields (S1 and S2) by Rock-Eval, total organic carbon (TOC), and vitrinite reflectance. Table 2 (Gothic Shale) and Table 3 (Hovenweep Shale) are tabulations of the geochemical analysis of the cores from the Barrett area and Ute Mountain Ute Reservation. Log characteristics, geochemical data, and core photographs for a representative sample of the Gothic Shale (located in the eastern portion of the Ute Mountain Ute Reservation) are shown in Figure 7.

Formation: Gothic Shale																				
Gothic Shale - TOTAL ORGANIC CARBON, PROGRAMMED PYROLYSIS DATA																				
Depth (ft) Top	Area	Well Name	Location	USGS Core #	API #	Operator	Formation	Sample Type	Leco TOC	RE			Tmax (°C)	Ro, %	HI	OI	S2/S3	S1/TOC	PI	Lab ID
										S1	S2	S3								
5988.8	Ute Mountain Ute	9-21 Antelope	NW 9-T33 N-R20 W	S663	5083064120000	Wintershall Oil and Gas	Gothic Shale	Core	2.05	1.49	3.26	0.60	445	1.17	159	29	5.4	73	0.31	3401728214
5925	Bill Barret	1-4 Norton Federal	NE 4-T38 N-R18W	D969	5083062600000	McCulloch Oil	Gothic Shale	Core	1.65	0.76	0.61	0.46	481	1.57	37	28	1.3	46	0.55	3401728278
5901	Bill Barret	1-4 Kissinger Federal	NE 4-T38 N-R18W	D598	5083061740000	Kissinger Pet.	Gothic Shale	Core	1.56	0.72	0.44	0.54	489	1.40	28	35	0.8	46	0.62	3401728280
6141.3	Ute Mountain Ute	34-13 Grouse	SW 34-T33 N-R20W	T175	5083064620000	Wintershall Oil and Gas	Gothic Shale	Core	1.63	2.02	2.61	0.46	440	1.32	160	28	5.7	123	0.44	3401728282
8771.5	Ute Mountain Ute	44-34 Ute Mtn.	SE 34-T34 N-R14W	D418	5083061720000	Phillips Petroleum	Gothic Shale	Core	1.71	0.35	0.35	0.26	550	1.49	20	15	1.3	20	0.50	3401728284

Notes:

* -1* - not measured or invalid value for T_{max}
TOC - Total Organic Carbon, wt. %
S1 - volatile hydrocarbon (HC) content, mg HC/ g rock
S2 - remaining HC generative potential, mg HC/ g rock
S3 - carbon dioxide content, mg CO₂/ g rock

* - comments regarding contamination
** - low S2, Tmax is unreliable
Meas. %Ro - measured vitrinite reflectance
HI - Hydrogen index = S2 x 100 / TOC, mg HC/ g TOC
OI - Oxygen Index = S3 x 100 / TOC, mg CO₂/ g TOC
PI - Production Index = S1 / (S1+S2)

Pyrogram:
f - flat S2 peak
n - normal
ltS2sh - low temperature S2 shoulder
htS2sh - high temperature S2 shoulder
ltS2p - low temperature S2 peak
htS2p - high temperature S2 peak

LECO - TOC on Leco Instrument
RE - Programmed pyrolysis or TOC on Rock-Eval instrument
SRA - Programmed pyrolysis by SRA Instrument
EXT - Extracted Rock
NOPR - Normal Preparation

TABLE 2. Gothic Shale Geochemistry, including Total Organic Carbon, Vitrinite Reflectance, and Programmed Pyrolysis Data, for wells from the Ute Mountain Ute Reservation and the Bill Barrett Corp. Shale-Gas Play area (analysis by Weatherford Laboratories).

Formation: Hovenweep Shale				Hovenweep Shale																	TOTAL ORGANIC CARBON, PROGRAMMED PYROLYSIS DATA										
Depth (ft) Top	Area	Location	Well Name	USGS Core #	API#	Operator	Formation	Sample Type	Sample Prep	Leco TOC	RE			Tmax (°C)	Ro, %	HI	OI	S2/S3	S1/TOC	PI											
											S1	S2	S3																		
8058	Ute Mountain Ute	NE 1-T32 N-R17W	#1 Mesa A	#1 Mesa A	5083050720000	Phillips Petroleum	Hovenweep Shale	Core	NOPR	0.75	0.29	0.89	0.48	440	1.46	119	64	1.9	39	0.25											
5500	Ute Mountain Ute	SE 17-T32 N-R20W	#1 Ute	Hondo #1 UTC	5083050190000	Honolulu Oil Corp	Hovenweep Shale	Core	NOPR	1.06	0.57	1.61	0.34	442	1.10	152	32	4.7	53	0.26											
5871	Barrett	NE 3-T38 N-R18W	1-4 Norton Federal	D969	5083062600000	McCulloch Oil	Hovenweep Shale	Core	NOPR	1.36	0.38	0.32	0.46	529	1.79	24	34	0.7	28	0.54											

Notes:

"-1*" - not measured or invalid value for T_{max}
TOC - Total Organic Carbon, wt. %
S1 - volatile hydrocarbon (HC) content, mg HC/ g rock
S2 - remaining HC generative potential, mg HC/ g rock
S3 - carbon dioxide content, mg CO₂/ g rock

* - comments regarding contamination
** - low S2, Tmax is unreliable
Meas. %Ro - measured vitrinite reflectance
HI - Hydrogen index = S2 x 100 / TOC, mg HC/ g TOC
OI - Oxygen Index = S3 x 100 / TOC, mg CO₂/ g TOC
PI - Production Index = S1 / (S1+S2)

Pyrogram:
f - flat S2 peak
n - normal
ltS2sh - low temperature S2 shoulder
htS2sh - high temperature S2 shoulder
ltS2p - low temperature S2 peak
htS2p - high temperature S2 peak

LECO - TOC on Leco Instrument
RE - Programmed pyrolysis or TOC on Rock-Eval instrument
SRA - Programmed pyrolysis by SRA Instrument
EXT - Extracted Rock
NOPR - Normal Preparation

TABLE 3. Hovenweep Shale Geochemistry, including Total Organic Carbon, Vitrinite Reflectance, and Programmed Pyrolysis Data, for wells from the Ute Mountain Ute Reservation and the Bill Barrett Corporation Shale-Gas Play area (analysis by Weatherford Laboratories).

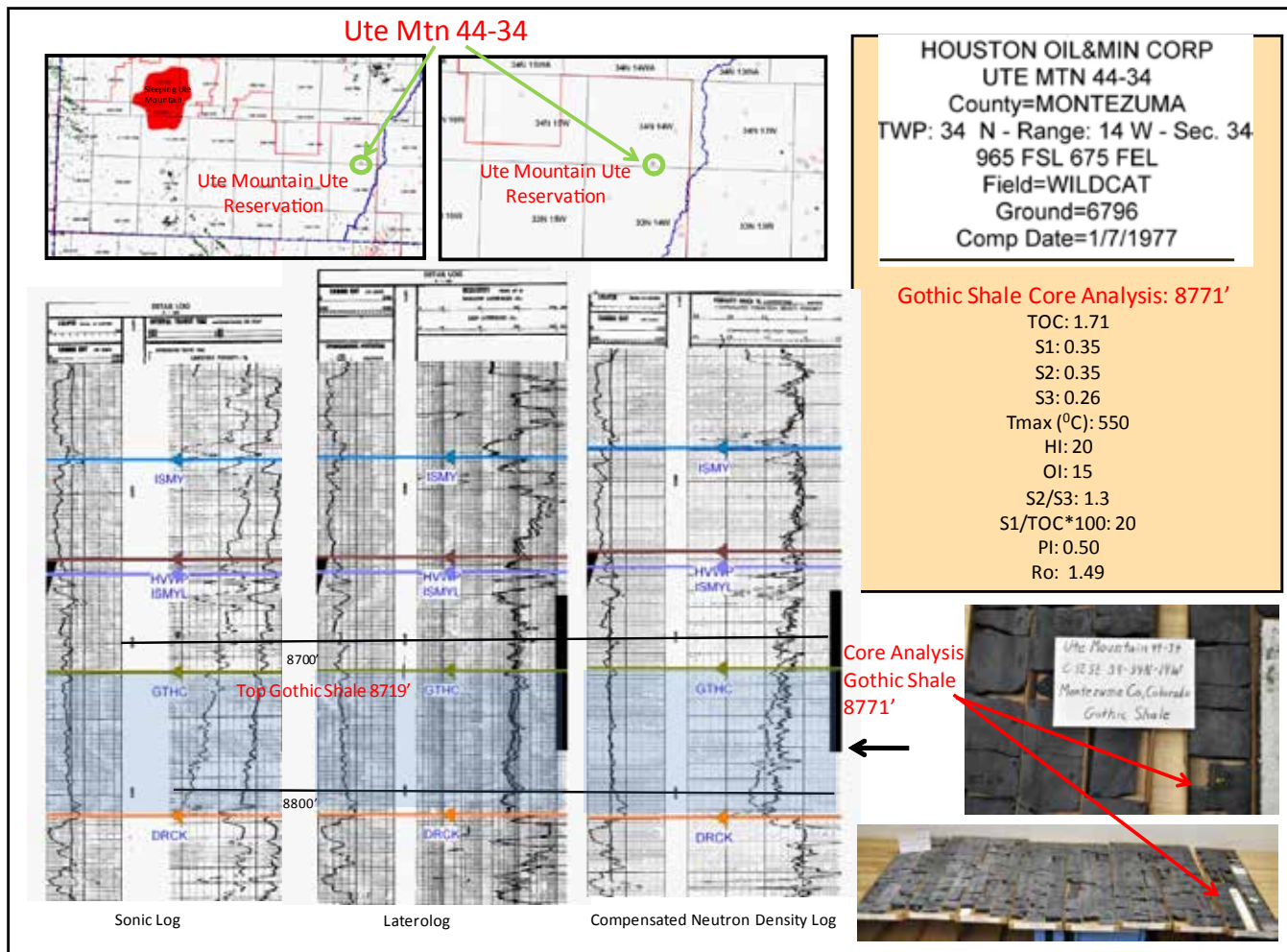


Figure 7. Log characteristics and Core Data, including sample location map, sample depth (shown on electric logs), core photograph, programmed pyrolysis hydrocarbon yields (S1 and S2) by Rock-Eval, total organic carbon (TOC), and vitrinite reflectance. Gothic Shale, Eastern Portion Ute Mountain Ute ReservationUMUR, Ute Mountain 44-34.

Geochemistry of the Hovenweep Shale - Ute Mountain Ute Reservation

The vitrinite reflectance(Ro) values for the Hovenweep Shale from wells on the Ute Mountain Ute Reservation increase from 1.10% at a depth of 5500.5' (western portion of the reservation) to 1.46% at 8058.5' (central /eastern portion of the reservation). These data suggest thermal maturity increases from the late oil window? – condensate-wet gas generation zone to the early dry gas window with increasing depth (Weatherford, 2010), and from the western portion of the reservation toward the central-eastern portion, where the Hovenweep Shale is the thickest (see Figure 8, Ro Geochemical Log 5). Thermal Alteration Indices (TAI), which range from 3-3+ (5500') to 4+ (8058'), support this Ro interpretation. TOC values range from 0.75 – 1.06%, indicating “fair” organic richness.

The Hovenweep Shale is classified as Type III kerogen based on TOC weight % versus S2 (remaining hydrocarbon potential) and OI (oxygen index) versus HI (hydrogen index) plots - Figures 9 and 10, respectively. Figure 11 illustrates the relationship between maturity and kerogen conversion by plotting the measured vitrinite reflectance in oil (%Ro) versus the production index (PI). A high level of conversion from the condensate-wet gas zone (western reservation) to the dry gas window (eastern) is indicated.

Geochemistry of the Gothic Shale - Ute Mountain Ute Reservation

The Gothic Shale is considered more prospective than the Hovenweep Shale in the area of Ute Mountain Ute Reservation. Similar to the vitrinite reflectance (Ro) and TAI trends interpreted for the Hovenweep Shale, the Gothic Shale values increase with depth (Figure 8, Ro Geochemical Log 5) and toward the eastern portion of the reservation from a condensate-wet gas maturity equivalent to a thermal maturity associated with dry gas (Ro: 1.17%, 1.32%, 1.49% at 5988.8', 6141.3', and 8771.5'). This is also illustrated in Figure 11 [measured vitrinite reflectance in oil (%Ro) versus the production index (PI)] where samples from wells on the western portion of the reservation plot in the condensate-wet gas zone, while the sample from the eastern portion falls into the dry gas window. TAI increases from 3+ to 4+ with increasing depth).

The Rock-Eval Tmax values for both the Gothic and Hovenweep in the Ute Mountain Ute area were deemed unreliable by Weatherford Labs. TOC values for the Gothic Shale in the Ute Mountain Ute area range from 1.63 to 2.05%, indicating relatively good organic richness (refer to Figure 8, Geochemical Log 1).

S2 values between 2.61 to 3.26 mg HC/g rock (refer to Figure 8, Geochemical Log 2) suggest the Gothic Shale is a fair to good quality source rock, and S1 data from shallow depths along the western portion of the reservation (1.49 – 2.05 mg/g rock) indicate “the rocks have good generative capacity for liquid hydrocarbons” (Weatherford, 2010).

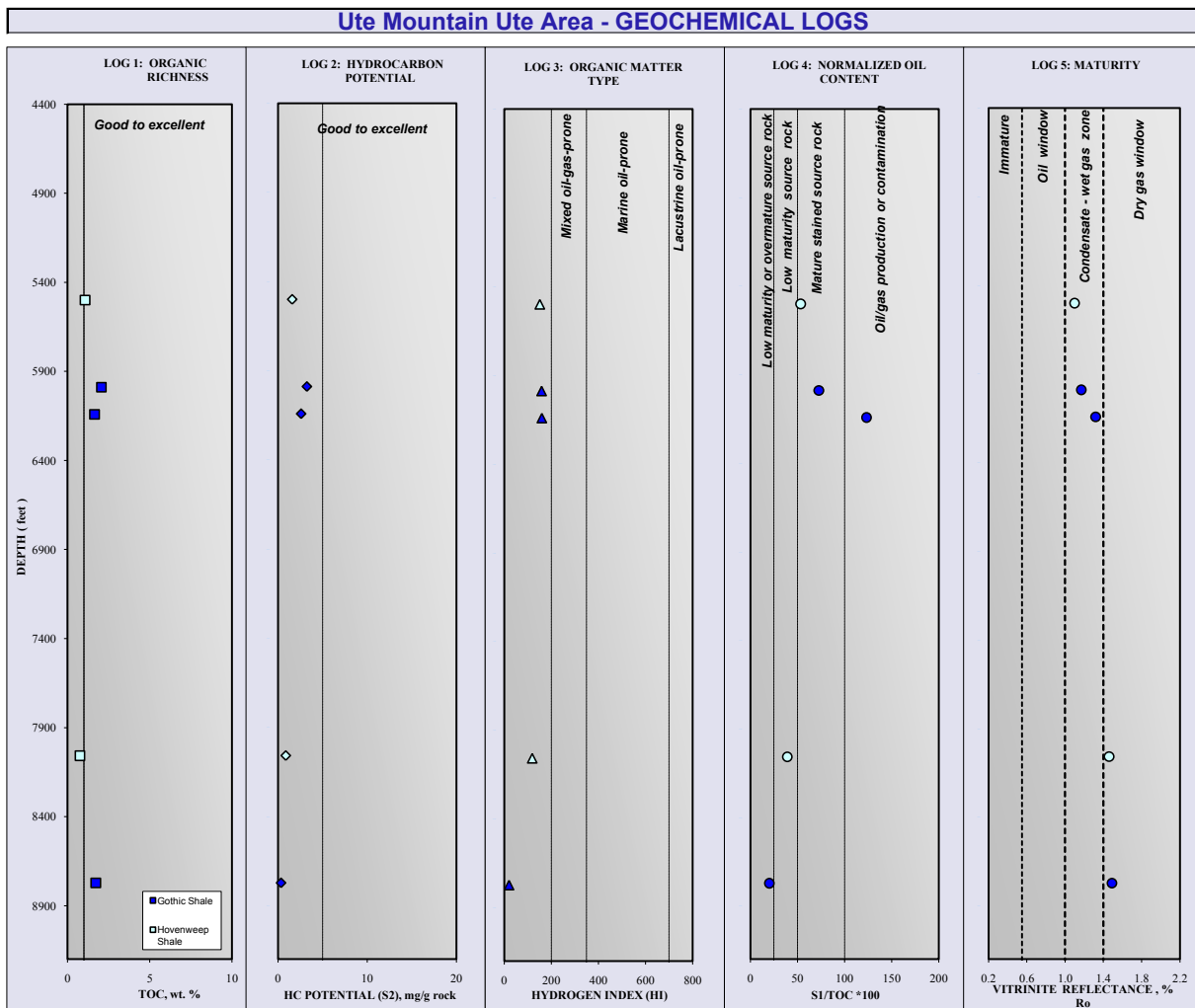


Figure 8. Geochemical logs; Log 1, Organic Richness – TOC weight% versus depth; Log 2, Hydrocarbon Potential – HC Potential (S2) versus depth; Log 3, Organic Matter Type – Hydrogen Index versus depth; Log 4, Normalized Oil Content – S1/TOC*100 versus depth; Log 5, Maturity - %Ro versus depth (generated by Weatherford Laboratories).

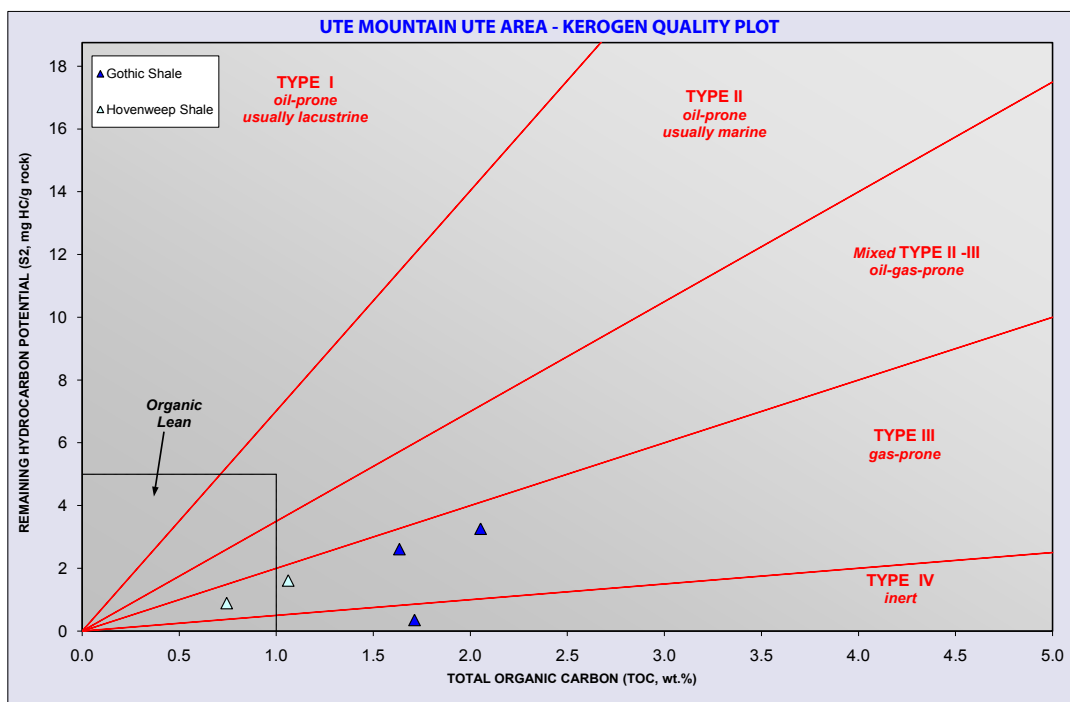


Figure 9. Kerogen Quality Plot - Total Organic Carbon (TOC weight %) versus Remaining Hydrocarbon Potential (S₂, mg HC/g rock) for samples from the Gothic Shale and Hovenweep Shale from wells located on the Ute Mountain Ute Reservation (generated by Weatherford Laboratories).

The Kerogen Quality Plot (Figure 9) depicting total organic carbon (TOC weight %) versus remaining hydrocarbon potential (S₂, mg HC/g rock) and Kerogen Type Plot showing hydrogen index (HI) versus oxygen index (OI) (Figure 10) indicate Type III-gas prone and Type IV-inert. However, based on organic petrology, the Gothic Shale original organic matter type varies “from oil-prone Type II to mixed Type II-III and gas prone Type III” (Weatherford, 2010). Figure 12 shows an example of vitrinite reflectance data from a well located on the western portion of the reservation (depth: 8,771.5 ft.). This sample is interpreted as Type III kerogen with good potential for gas generation.

Original and present Hydrogen Index (HI) values, used to interpret the conversion of kerogen to petroleum, indicate that where the Ute Mountain Ute Gothic and Hovenweep shales are shallow (western portion) the rocks “still have a relatively high generative capacity, most likely for producing light oil/condensate-wet gas according to their maturity”. In areas where the Gothic Shale is the deepest (eastern portion), the Gothic is “a good source for gas production” (Weatherford, 2010).

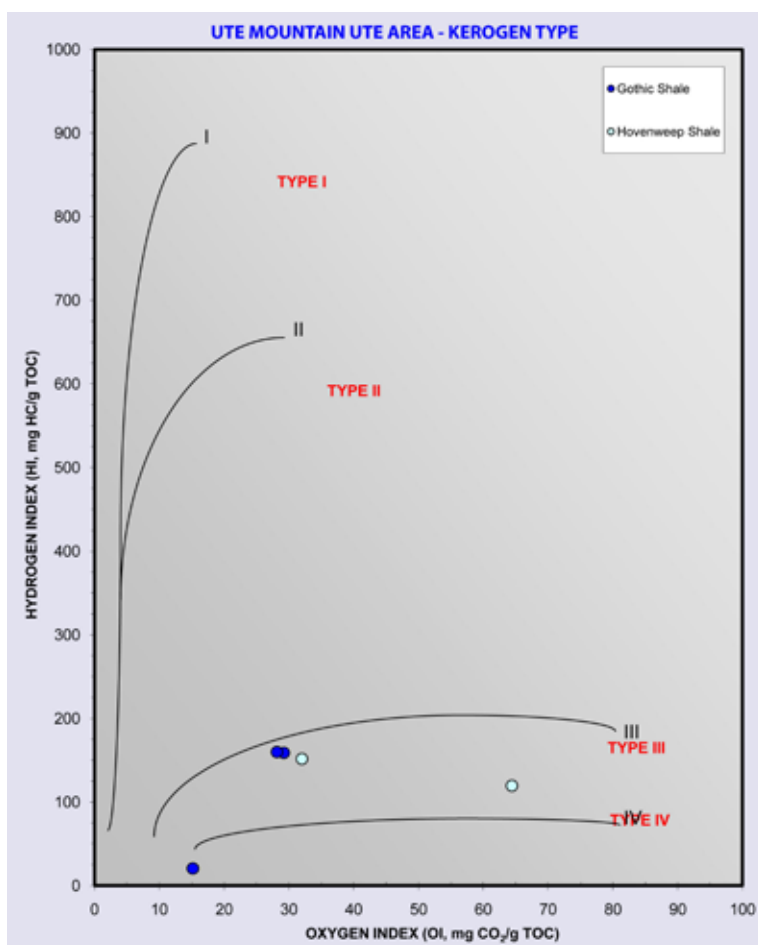
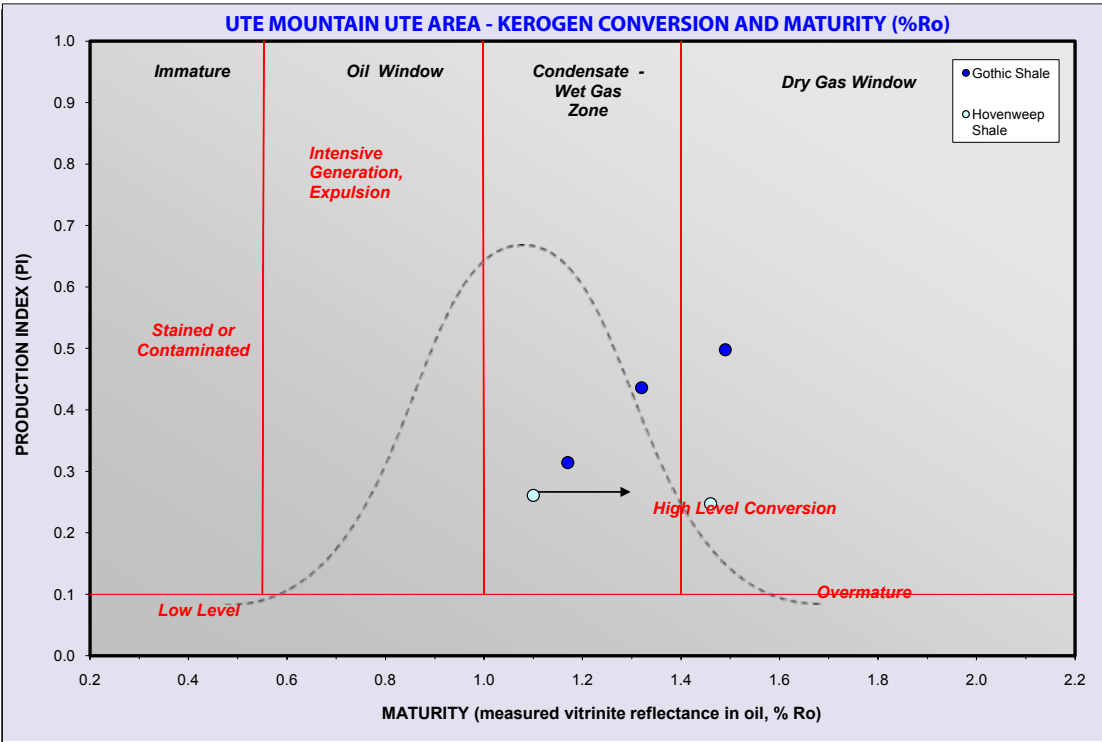
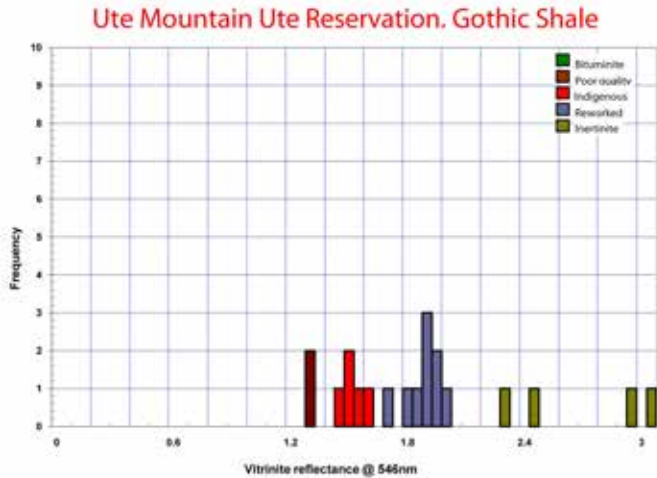


Figure 10. Kerogen Type - Oxygen Index (OI, mg CO₂/g TOC) versus Hydrogen Index (HI, mg HC/g TOC) for samples from the Gothic Shale and Hovenweep Shale from wells located on Ute Mountain Ute Reservation (generated by Weatherford Laboratories).

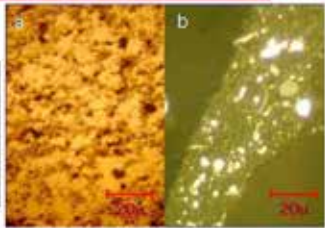
Figure 11. Kerogen Conversion and Maturity (%Ro) - Measured Vitrinite reflectance in Oil (%Ro) versus the Production Index (PI) for samples from the Gothic Shale and Hovenweep Shale from wells located on Ute Mountain Ute Reservation (generated by Weatherford Laboratories).



Vitrinite Reflectance and MOA



Depth (ft)	8,771.50
Minimum	1.43
Maximum	1.57
Points	5
Std Deviation	0.06
Mean	1.49



Comments:

Kerogen is dominated by non-fluorescing granular amorphous matter. There is an increase in woody particles, but much of this is most likely recycled particles, although there are occasional stringers of primary vitrinite. Organic matter fluorescence has extinguished. TAI (4+) is based on dark brown spores and pollen grains. Vitrinite reflectance indicates kerogen is wet gas/condensate zone mature. At this level of thermal maturity, kerogen will plot as Type III on a van Krevelen plot with a fair to good potential for the generation of gas. Photomicrographs show typical views in a) transmitted white light and b) incident blue light.

Ordered Ro Values

1.271	1.290	1.433	1.458	1.461	1.500	1.574	1.653	1.772	1.845	1.873	1.876
1.876	1.907	1.931	1.961	2.291	2.444	2.908	5.946				

Visual Kerogen Analysis

Well Name	Sample ID	Depth ft.	% Alg.	% Lip.	% Vit.	% Inert.	Liptinite Fluor.	% Oil Prone	% Gas Prone	TAI	% Solid Bit.	Pollen/Spores
44-34 Ute Mountain	3401728284	8,771.50	2*	42	36	22	X	0	40	4+	0	Minor

*Post mature for oil

Figure 12. Example of vitrinite reflectance data from a well located on the western portion of the reservation (depth: 8,771.5 ft.). This sample, Ute Mountain 44-34, is interpreted as Type III kerogen with good potential for gas generation.

Geochemical Comparisons and Gas/Oil Potential: Ute Mountain Ute Reservation and Bill Barrett Corp. Shale-Gas Play Area

The TOC, Ro, and programmed pyrolysis data of the Gothic Shale (Table 2) and the Hovenweep Shale (Table 3) for wells on Ute Mountain Ute Reservation and Bill Barrett Corp. shale-gas exploration area are summarized in a series of five geochemical logs (Figure 13 – Gothic Shale and Figure 14 – Hovenweep Shale), which plot TOC, S2, HI, S1/TOC*100, and Ro versus depth.

Table 4 provides an independent interpretation by Weatherford Laboratories of the Gothic and Hovenweep shales' capacity as source rock for both the BBC and Ute Mountain Ute areas. Their review of the data indicates that the Hovenweep may have better gas potential in the BBC area versus the Ute Mountain Ute Reservation. The Gothic appears marginally better for gas potential in Ute Mountain Ute area, but considerably better for liquid hydrocarbon potential when compared to the BBC area. This is especially true for the western portion of the reservation.

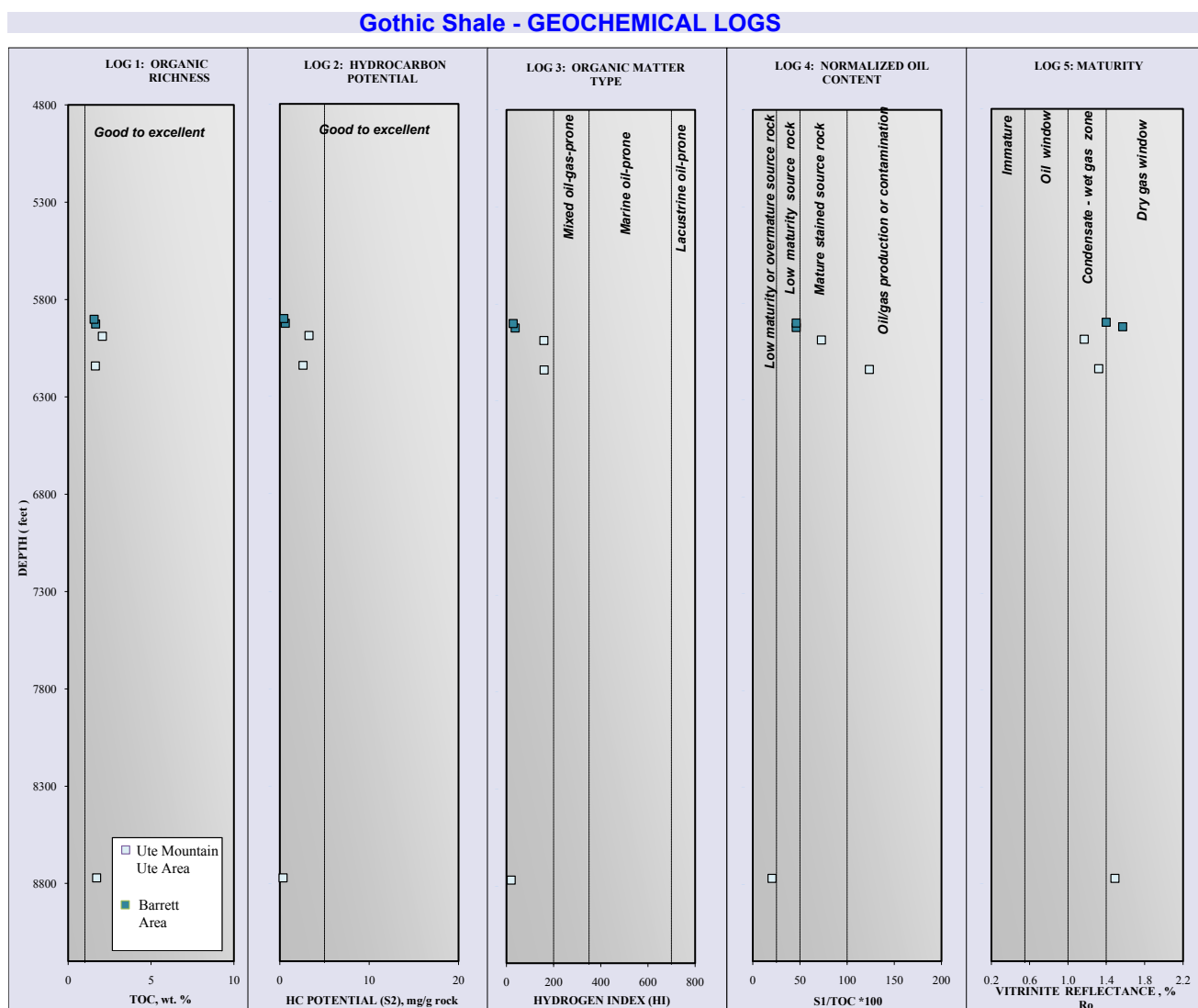


Figure 13. Geochemical Logs for Gothic Shale, Ute Mountain Ute Reservation and Bill Barrett Corporation Area - TOC, S2, HI, S1/TOC*100, and Ro versus Depth: (Log 1, Organic Richness – TOC weight% versus depth; Log 2, Hydrocarbon Potential – HC Potential (S2) versus depth; Log 3, Organic Matter Type – Hydrogen Index versus depth; Log 4, Normalized Oil Content – S1/TOC*100 versus depth; Log 5, Maturity - %Ro versus depth (generated by Weatherford Laboratories).

Hovenweep Shale - GEOCHEMICAL LOGS

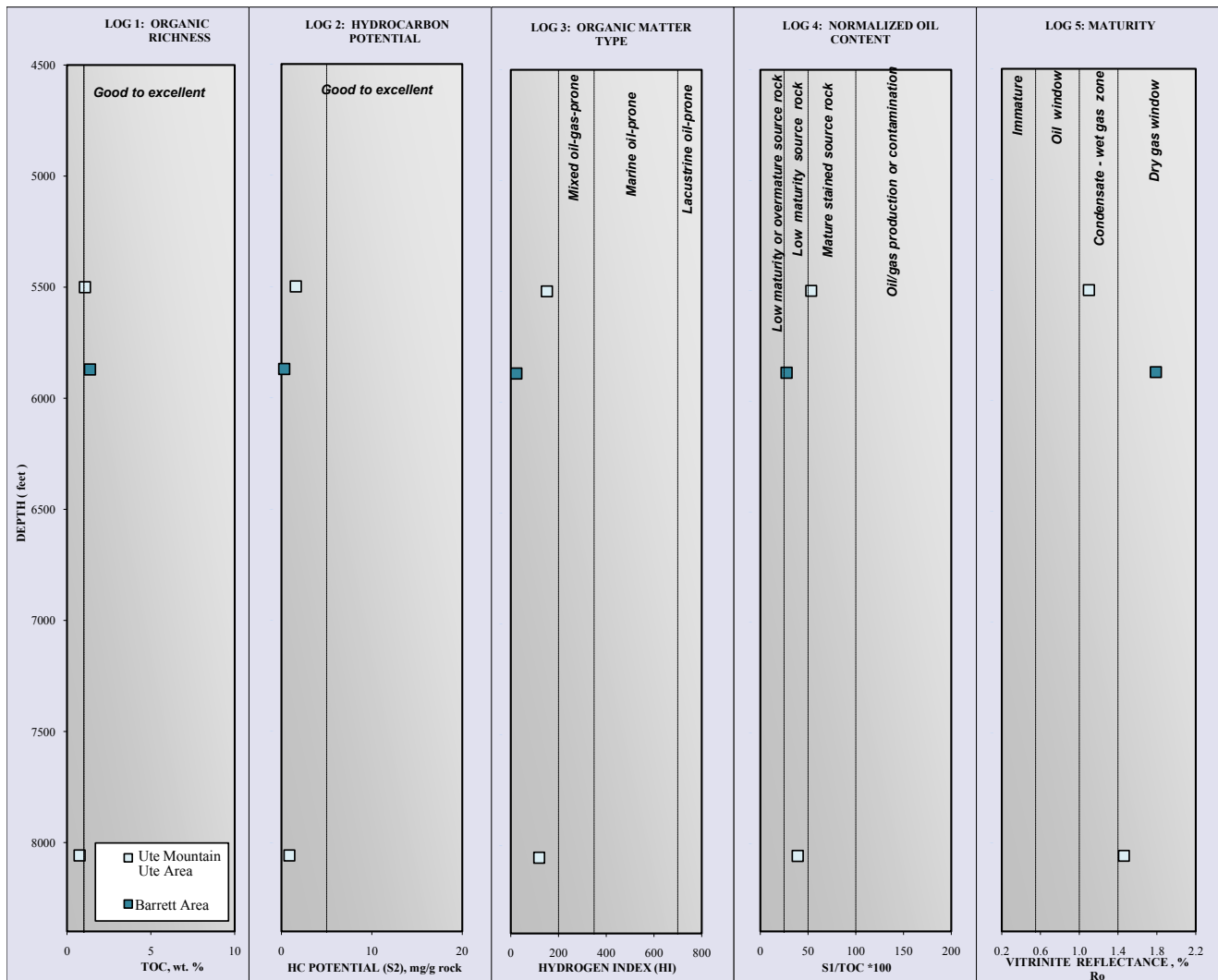


Figure 14. Geochemical Logs for Hovenweep Shale, Ute Mountain Ute Reservation and Bill Barrett Corporation Area - TOC, S2, HI, S1/TOC*100, and Ro versus Depth: (Log 1, Organic Richness – TOC weight% versus depth; Log 2, Hydrocarbon Potential – HC Potential (S2) versus depth; Log 3, Organic Matter Type – Hydrogen Index versus depth; Log 4, Normalized Oil Content – S1/TOC*100 versus depth; Log 5, Maturity - %Ro versus depth (generated by Weatherford Laboratories).

Table 4: Source Rock Evaluation of Hovenweep and Gothic Shales as interpreted by Weatherford Laboratories.

Shale	Depth interval, ft	Hydrocarbon generation zone	TOC (wt%)	Kerogen type	Source rock for liquid HC	Shale gas potential
Ute Mountain Ute Reservation						
Hovenweep	5500 - 5501	condensate -wet gas	1.06	Type III	poor	low
	8058- 8059	condensate - wet-dry? gas	0.75			
Gothic	5988.8 - 6141.3	condensate -wet gas	1.63 - 2.05	Type III	good	fair - good
	8771.5	dry gas	1.71	Type IV	very poor	
Bill Barrett Corp. Area						
Hovenweep	5871	dry gas	1.36	Type IV	very poor	low - fair
Gothic	5901 - 5925	dry gas	1.60	Type IV	very poor	low - fair

Summary

Favorable comparisons in thicknesses, drilling depths, and geochemistry (TOC, Ro, and programmed pyrolysis data) between the Gothic and Hovenweep shales present in the area of Ute Mountain Ute Reservation with those to the north where Bill Barrett Corporation is currently drilling and completing successful, horizontal shale-gas wells indicate promising oil/gas exploration targets on the Ute Mountain Ute Reservation.

The data suggests that the Gothic Shale in the eastern portion of the reservation, which lies within the thickened section extending from the BBC area, is in the gas window. In the western portion of the reservation, the Gothic shale is more light oil/condensate-wet gas prone. The Hovernweep may be somewhat less prospective on the Ute Mountain Ute Reservation versus the BBC area. The reservation holds thousands of prospective contiguous acres. Although most of the reservation is open for exploration, there is sacred land (Sleeping Ute Mountain) where drilling is not allow (outlined in orange – Figures 4, 5, and 6) and park land where drilling restrictions may apply (outlined in purple – Figures 4, 5, and 6).

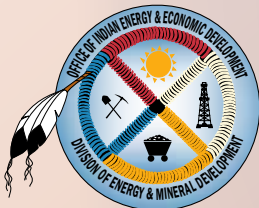
**For more information on this play opportunity,
please contact:**



Ute Mountain Ute Tribe

Ute Mountain Ute Indian Reservation

Gordon Hammond
Director, Tribal Energy Office
Tribal Energy Office: (970) 564-5690
Cell Phone: (970) 749-6835
E-mail: ghammond@utemountain.org



Division of Energy and Mineral Development

Robert Anderson (720) 407-0602
Branch Chief / Geophysicist
Email: robert.anderson@bia.gov

Bureau of Indian Affairs
13922 Denver West Parkway, Ste. 200
Lakewood, CO 80401

