Well Identification:

API#	AREA	BLOCK	OPERATOR	WELL NAME	
55367000010000	ST GEORGE EAST	807	Exxon Corporation	OCS Y-0530 TUSTUMENA 1 ST00BP00	
LATITUDE	LONGITUDE	KB	WATER DEPTH	GEO DATUM	ZONE
56° 9' 50.1306"	-167° 9' 18.9295"	89	-420	NAD83	5

Overview

The Tustumena 1 was spud as an exploratory well on August 29th, 1984 and located in the Bering Sea of the St. George Basin. The operator reported no commercial hydrocarbons were discovered at this location, the well was plugged and abandoned. The comprehensive analytical data collection program included well logging and rotary sidewall coring provided by Schlumberger, whole coring, and drill cutting samples collected by BLP. Collected samples were analyzed by Core Laboratories, Petroleum Services for lithology, fluid saturation, pore volume, and hydrocarbon source generation.

Geologic Intervals used for Analysis:

Age/Period	Stratigraphy	Top	Source	Comments
Pliocene		1850	Geologic Markers	Form 9-330 or 1010-0046
Late Miocene		4160	Geologic Markers	
Oligocene		6910	Geologic Markers	
Jurassic		7200	Geologic Markers	

Logging Runs and Parameters:

LOGGED	TOP	BASE	TEMP	BITSIZE	MWIN	RM	WIRELINE RUNS												
INTERVAL	ft	ft	degF	in	ppg	ohmm	RUN#	GR	DLL	DIL	NUC	SON	VSP	DIP	MICRO	SGR	SP	TEMP	RFT
1	844	1569	95	12.25	9.3	2.14	1	X		X		X					X		
2	1472	2563	95	12.25	9.5	0.757	1	X		X		X					X		
3	2522	7463	168	12.25	10.8	2.14	1	X			X					X			
							2	X											X
							3	X		X		X					X		
4	7066	8748	198	12.25	10.8	1.67	1	X			X					X			
							2	X											X
							3												
							4	X		X		X					X	X	

Cored Intervals and Sample Analysis:

TOP	BASE	WHOLE CORE		TOP	BASE	SWS CORE	
ft	ft	ft	ROUTINE SCAL	ft	ft	#REC	ROUTINE SCAL
7191	7201	4	7	2626	8682	260	98
7207	7228	21	22				

Log Discussion:

The Tustumena 1 well was drilled and logged with water-based drilling fluid containing Barite weighting material to total depth. Subsequent borehole sections were drilled with additional Barite to increase the borehole fluid pressure overbalance. All borehole sections required environmental corrections for hole size, temperature, pressure, and mud weight additives.

RPS/TetraTech
Derek Buster/Petroforensics

Environmental Corrections:

The Schlumberger 2000 Edition chartbook was used to correct the logs for borehole size, temperature, pressure, and drilling mud additives. The Gamma Ray log was corrected using chart GR-1. Compensated Neutron log was corrected using Por-14c and Por -14d. Dual Laterolog Resistivity logs were corrected using Rcor-2c and invasion corrected using Rint-9b. Dual Induction logs were corrected using Rcor-4a and invasion corrected using Rint-10.

Significant caliper enlargements were observed in deeper sections of the well, in cases where the borehole caliper readings were above the correction charts, the maximum chart correction was applied, however these corrections under estimate the true formation measurement.

The bulk density measurement was the most environmentally affected log in the dataset, where the density log readings measured drilling fluid when the caliper reading exceed 16 inches. Repair of the density log utilized a Gardner et al. (1974) sonic to density transform.

Observations Logged Interval 1

Observed some high caliper readings in the deeper section, however most of the logged interval showed the borehole was in decent condition up shallow and required little editing using the Gardner[1] density transform. Core Porosity measurements from the lab are very high up shallow with some results above the upper limit of perfectly sorted spherical grains, Graton and Fraser[2]. Sonic log travel-time deeper than 1612 feet measured depth observed faster than the mud slowness arrival for seawater-based drilling fluid at 189 us/ft from Carmichael[3]. Sonic log data was compared to the Faust[4] velocity transform to correct anomalies in borehole washouts. Logged intervals where the bulk density was not present the delta-t sonic was used as the porosity model input to the final computed results.

References

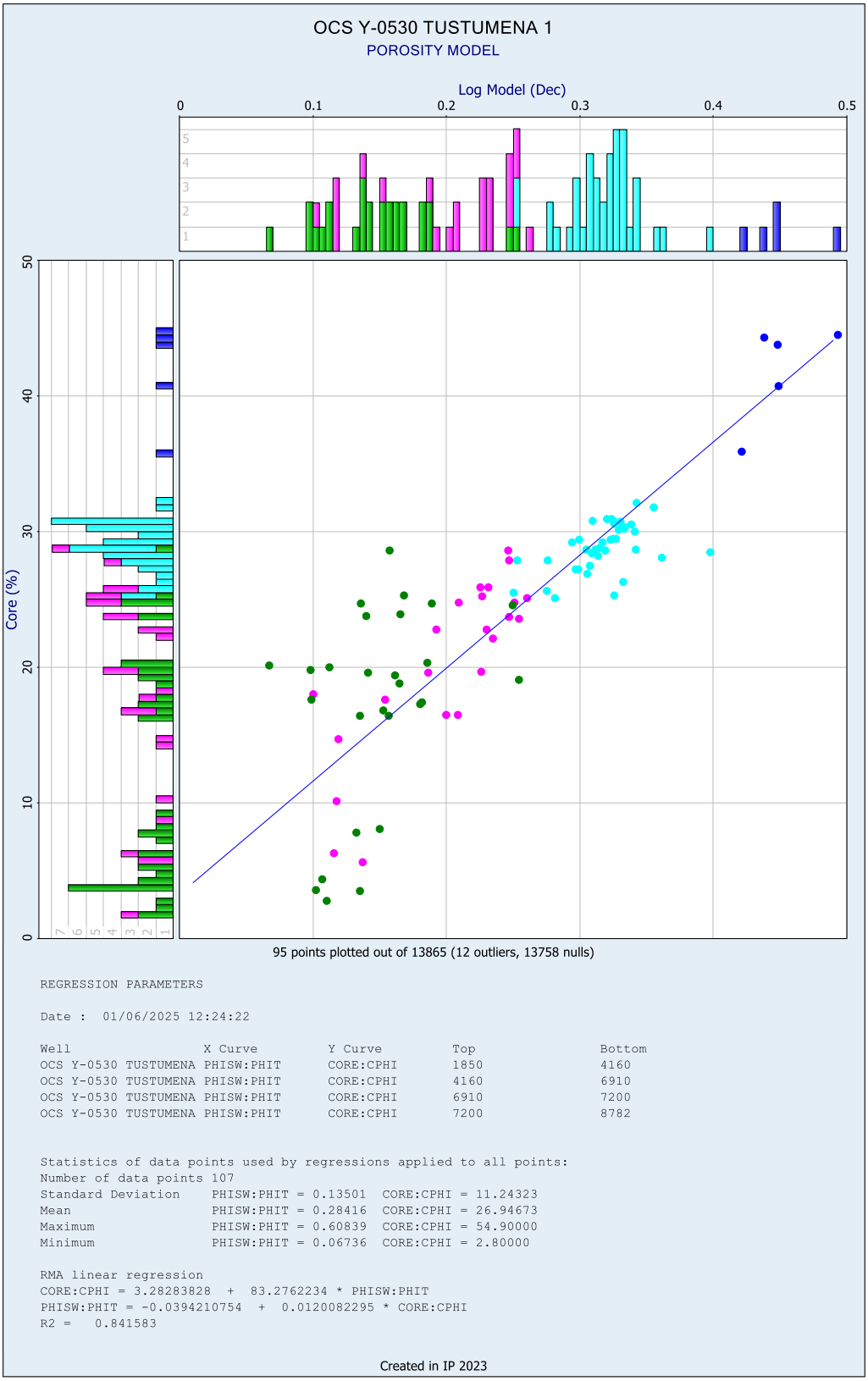
1. Gardner et al., 1974, Formation velocity and density—the diagnostic basics for stratigraphic traps Geophysics, 39 (6) (1974), pp. 770-780
2. Graton, L. C., and H. J. Fraser, 1935, Systematic packing of spheres with particular reference to porosity and permeability: Journal of Geology, v. 43, p. 785–909, DOI: 10.1086/jg.1935.43.issue-8
3. Carmichael, R.S. ed. 1982. Handbook of Physical Properties of Rocks, Vol. 2, 1-228. Boca Raton, Florida: CRC Press Inc.
4. L. Y. Faust, "A Velocity Function Including Lithologic Variation," Geophysics, Vol. 18, No. 2, 1953, pp. 271-288.

Summation Report:

RESERVOIR SUMMARY											
Zone	Zone Name	Top	Bottom	Gross	Net	N/G	Av Phi	Av Sw	Av Vcl	Phi*H	PhiSo*H
1	ORIGINAL BOREHOLE	509	8800	8273	4536.5	0.548	0.379	0.97	0.287	1719.16	51.38

Reservoir summary cut off values used were porosity greater than 20% (PHIE > 0.2), shale volume less than 40% (VSHALE < 0.4), and water saturation less than 50% (SW < 0.5).

Core versus Log Porosity Crossplot:



REGRESSION PARAMETERS

Date : 01/06/2025 12:24:22

Well	X Curve	Y Curve	Top	Bottom
OCS Y-0530 TUSTUMENA	PHISW:PHIT	CORE:CPHI	1850	4160
OCS Y-0530 TUSTUMENA	PHISW:PHIT	CORE:CPHI	4160	6910
OCS Y-0530 TUSTUMENA	PHISW:PHIT	CORE:CPHI	6910	7200
OCS Y-0530 TUSTUMENA	PHISW:PHIT	CORE:CPHI	7200	8782

Statistics of data points used by regressions applied to all points:

Number of data points	107	
Standard Deviation	PHISW:PHIT = 0.13501	CORE:CPHI = 11.24323
Mean	PHISW:PHIT = 0.28416	CORE:CPHI = 26.94673
Maximum	PHISW:PHIT = 0.60839	CORE:CPHI = 54.90000
Minimum	PHISW:PHIT = 0.06736	CORE:CPHI = 2.80000

RMA linear regression

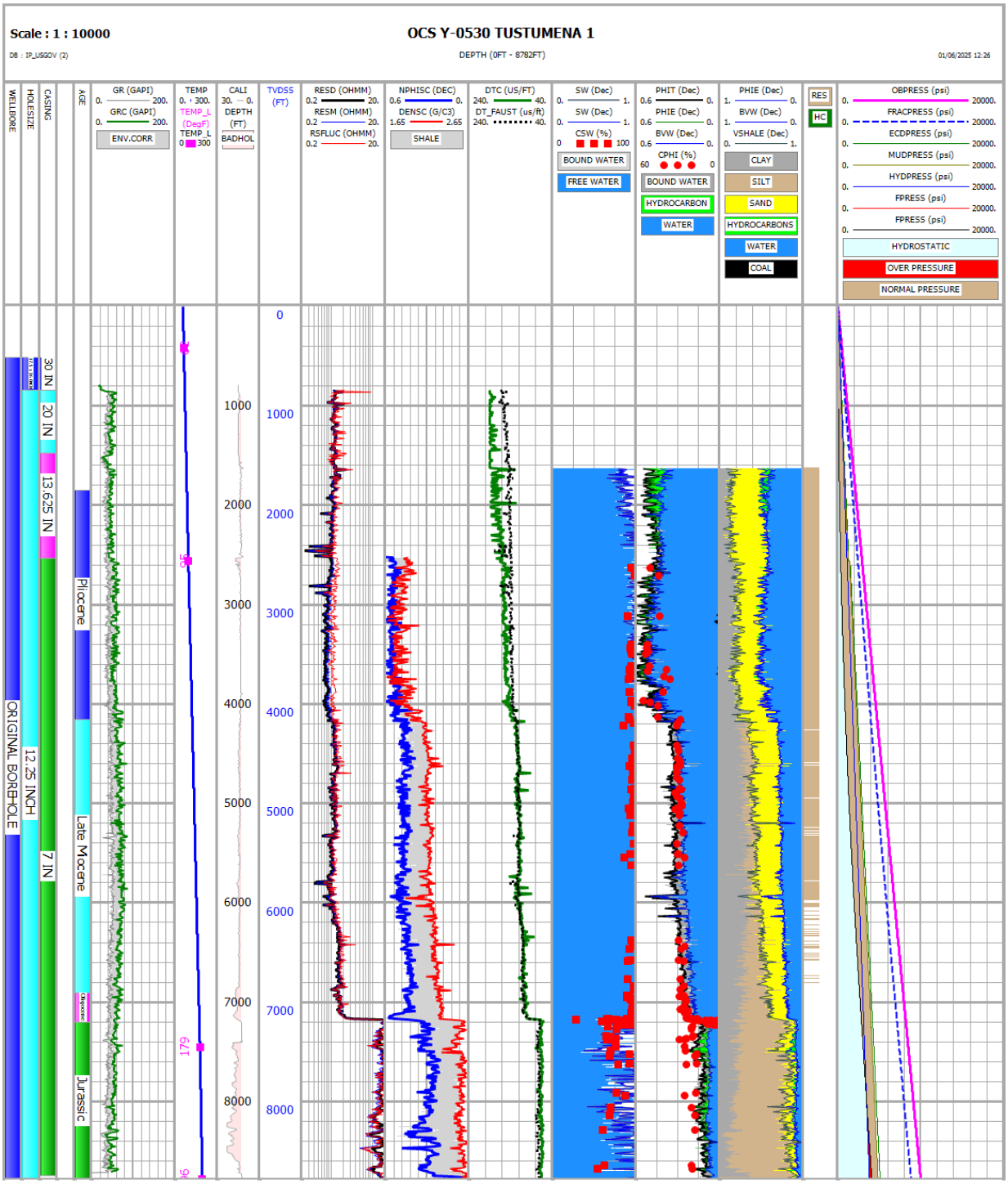
CORE:CPHI = 3.28283828 + 83.2762234 * PHISW:PHIT

PHISW:PHIT = -0.0394210754 + 0.0120082295 * CORE:CPHI

R2 = 0.841583

Created in IP 2023

Summary Plot:



Report Date: 01/10/2025