

WELL REPORT

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DEPT OF GEOLOGY  
& MINERAL INDUSTRIES

Grizzly Drilling Company  
Grizzly #1  
NE SW Section 33, T12S-R15E  
Jefferson County, Oregon

AREA: Wildcat (Hay Creek Anticline)

ELEVATION: 3450' GL (est), 3454' KB (Depth Datum)

SPUD: November, 1977

CEASE DRILLING: February, 1978

CASING: 8 5/8" 28# 8.017" I.D. @ 462'

CONTRACTOR: Grizzly Drilling Company

CORES: None

DSTS: #1 1810'-1905', #2 & 3 1230'-1325', #4 1083'-1330'  
All tests inflate-straddle

GAS DETECTOR: Tooke Unmanned Unit, Surface to T.D.

SAMPLES: 10' Samples, Surface to T.D. with Grizzly Drilling Company

LOGS: Schlumberger, DIL, FDC/CNL/GR w/partial caliper

TOTAL DEPTH: <sup>3544'</sup>~~2549'~~ Drl., 3542' Lgr.

FORMATION AT TD: Clarno Formation (Eocene)

GEOLOGICAL INTERPRETATION

System	Epoch	Formation	From	To	Datum	Fluid	How
					Of Top	Content	Determined
Tertiary							
Eocene		Surface	3550' (T.D.)	+3450'	Water	Samples--logs	
		Clarno Fm.			w/tr hyddb gas	DST	

11/10/74

GEOLOGICAL SUMMARY

Grizzly Drilling Company's Grizzly #1 well was drilled as a rank wildcat well to test the southwestern part of the Hay Creek Anticline. This structural feature is a breached and faulted anticlinal fold trending southwest-northeast and plunging to the northeast. An inlier of slightly metamorphosed Mesozoic rocks is exposed along the eroded crest of the fold and these rocks are almost entirely surrounded by volcanic tuffs and flows of the Eocene Clarno Formation. The exposed Mesozoic rocks are described as "phyllite and sedimentary rocks" of Triassic age by D. A. Swanson (1969), and are considered by D. L. Peck (1964), to be similar lithologically to marine cretaceous rocks which outcrop some thirty miles to the east.

Several attempts have been made to test this structure in the past, but these have all been abandoned prematurely without drilling deep enough to fully evaluate the sedimentary sequence of the structure.

The Grizzly #1 well was spudded in the Clarno Formation at the southwestern end of the structure and on its southeastern flank. As drilling progressed, it became evident that the Clarno Formation was thicker than anticipated. At a depth of 3549 feet, the Mesozoic or older rocks had not been penetrated and it was decided to suspend operations and to run electric logs and to test promising zones.

The volcanic rocks of the Clarno Formation encountered while drilling the well were of three general kinds. The first and most common kind were varicolored tuffs and volcanic breccias consisting of lithic and vitric volcanic fragments in an aphanitic to fine-grained ashy matrix, all highly altered to clay. The second rock type encountered was basalt flows and possibly small intrusive bodies. These were generally fine-grained but occasionally had a glassy groundmass. Evidence of secondary porosity from fractures and vesicles was indicated by abundant crystalline calcite.

The third rock type encountered was ignimbrite, or welded tuff. This consisted of crystal laths and vitric shards tightly welded together in a largely unaltered glassy matrix and showing an alignment reminiscent of flow banding. These rocks are considered noteworthy because fracturing of similar rocks in the Trap Springs area of Nevada has produced reservoir rocks from which oil is presently being produced.

Several shows were noted while drilling the well. These were as follows:

1. 1170'-1320' Gas shows of up to 90 hot-wire units
2. 1860' At this depth, oil was reported on the pits.

A small sample was collected and sent for analysis by Chemical and Geological Laboratories in Casper, Wyoming. Analysis indicated a very flat distillation graph not characteristic of most native crude oils. It should be noted, however, that the effect of nearby volcanic acidity could result in crude oil of unusual characteristics. The results of the analysis are included with this report.

3. 2900'-3549' (T.D.) Background gas of a few hot-wire units, but not more than 20 units, was carried through most of this zone.

Four drill-stem tests were performed with results as follows:

DST #1 1810'-1905' Opened with a weak blow which increased slightly to 1/2" of water in one minute and to 3" of water in 6 minutes. The flow had decreased to 1 1/2" of water on shut-in after 12 minutes. The second flow opened with a weak blow which died after 8 minutes. Forty feet of drilling mud was recovered with no trace of oil or gas. Recorded pressures indicated low permeability of the zone. The packer failed at the final shut-in. Extremely heavy drilling mud, the consistency of chocolate pudding, caused partial plugging of perforations during the test.

DST #2 1280'-1325' Initial open flow opened with blow off & #3 bottom of bucket and decreased to 5" at end of 5 minute pre-flow. Packers failed in both tests.

DST #4 1083'-1330' Opened with a fair blow which increased to 2" of water in 2 minutes. Blow decreased and died after 3 minutes and remained dead for the rest of the test. Seventy five feet of gas cut mud were recovered, and recorded pressures indicated that the formation was tight. Recorder charts also indicated that some plugging of the test tools may have occurred during the test, again due to extremely heavy drilling mud.

Schlumberger electric logs, (Dual Induction-SFL, Formation Density-compensated neutron with gamma-ray), were run through the entire well. These presented some problems in interpretation due to the volcanic nature of the rock and to the total lack of information of the conducting properties of the undisturbed formation fluids. No obvious hydrocarbons were indicated by the logs, but they were not conclusively negative. The zone from 2850 to 3100 feet bears resemblance to known productive ignimbrite zones in the Trap Springs area of Nevada.

#### CONCLUSIONS

This test of the Hay Creek Anticline has demonstrated that hydrocarbons are present in limited amounts within the structure. The Mesozoic or older rocks beneath the Clarno Formation remain the best potential source rocks for hydrocarbons and the best potential reservoir rocks. These were not penetrated in the subject well and are, as yet, unevaluated. It is recommended that future wells to be drilled on the Hay Creek Anticline be located close to or within the Mesozoic outcrop in order to assure that these higher potential reservoirs are penetrated and evaluated.

Respectfully,

*Patrick McConigley*

Patrick McConigley  
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Casper, WY 82602

BIR RECORD

No.	Size	Mfgr.	Type	Depth	Out Casing	Footage	Hours Run	Vertical Deviation
1	12 1/4	HTC	J-44		<u>462'</u>	462'	44	0°
2	7 7/8	HTC	J-44	790'		328'	48	4 3/4°
3	7 7/8	HTC	J-55				36	6 1/4°
4	7 7/8	HTC	J-44	1363'			48	7°
5	7 7/8	STC	F-4	1363'		0	0	
6	7 7/8	STC	F-4	2473'		1110'	143	3/4
7	7 7/8	STC	F-4	3187'		714'	101	1/2
8	7 7/8	STC	F-3	3549'		362'	87	

BIBLIOGRAPHY

Peck, D. L., 1964, Geologic Reconnaissance of the Antelope-Ashwood Area, North-Central Oregon, with Emphasis on the John Day Formation of Late Oligocene and Early Miocene Age: U. S. Geological Survey Bulletin 1161-D, p. D1-D26.

Swanson, D. A., (1969a), Reconnaissance Geologic Map of the East Half of the Bend Quadrangle, Crook, Wheeler, Jefferson, Wasco and Deschutes Counties, Oregon: U. S. Geological Survey Misc. Geol. Inv. Map 1-568, Scale 1:250,000.

CRUDE OIL ANALYSIS REPORT

Company Grizzly Drilling Company Date February 16, 1978 Lab. No. 26461  
 Well No. Grizzly No. 1 Location \_\_\_\_\_  
 Field \_\_\_\_\_ Formation \_\_\_\_\_  
 County Jefferson Depth \_\_\_\_\_  
 State Oregon Analyzed by \_\_\_\_\_ Staff \_\_\_\_\_

Sample skimmed from mud pits

GENERAL CHARACTERISTICS

Specific gravity @ 60/60 °F..... 0.8688  
 A.P.I. Gravity @ 60 °F..... 31.4  
 Saybolt Universal Viscosity @ 70 °F, seconds..... \_\_\_\_\_  
 Saybolt Universal Viscosity @ 100 °F, seconds..... \_\_\_\_\_  
 D. n. and water, % by volume..... \_\_\_\_\_  
 Pour point, °F..... \_\_\_\_\_  
 Total sulphur, % by weight..... \_\_\_\_\_

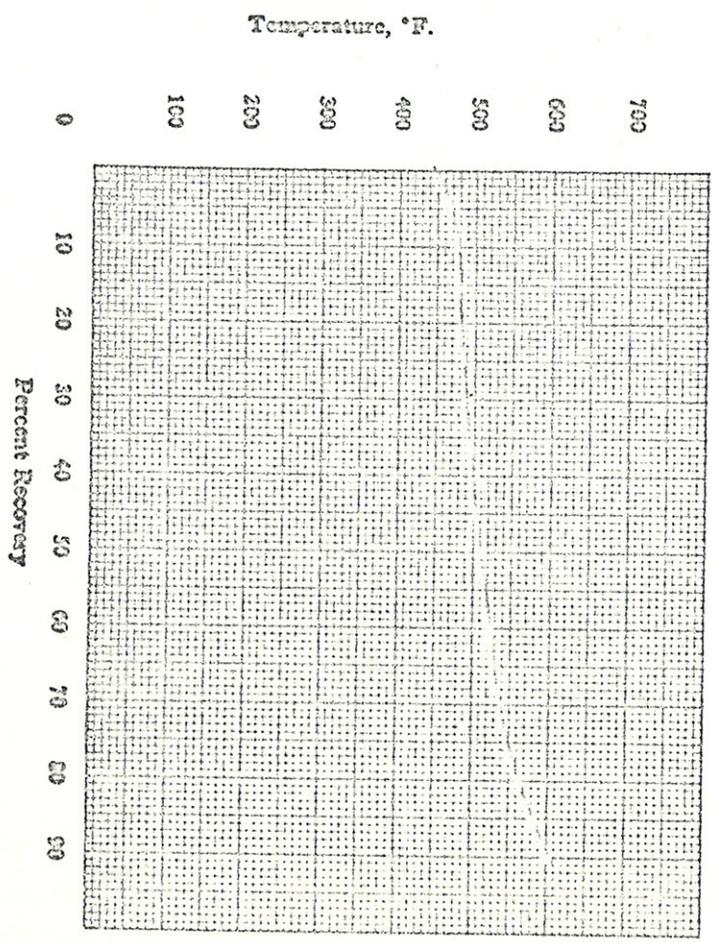
"CONFIDENTIAL"

REMARKS: This appears to be a weathered diesel fuel. (Very small sample submitted for testing).

ENGLER DISTILLATION

Recovery, %	Temperature, °F.
IBP	447
5	466
10	473
15	478
20	484
25	490
30	494
35	499
40	504
45	509
50	515
55	520
60	525
65	532
70	540
75	550
80	566
85	585
90	606
95	

DISTILLATION GRAPH



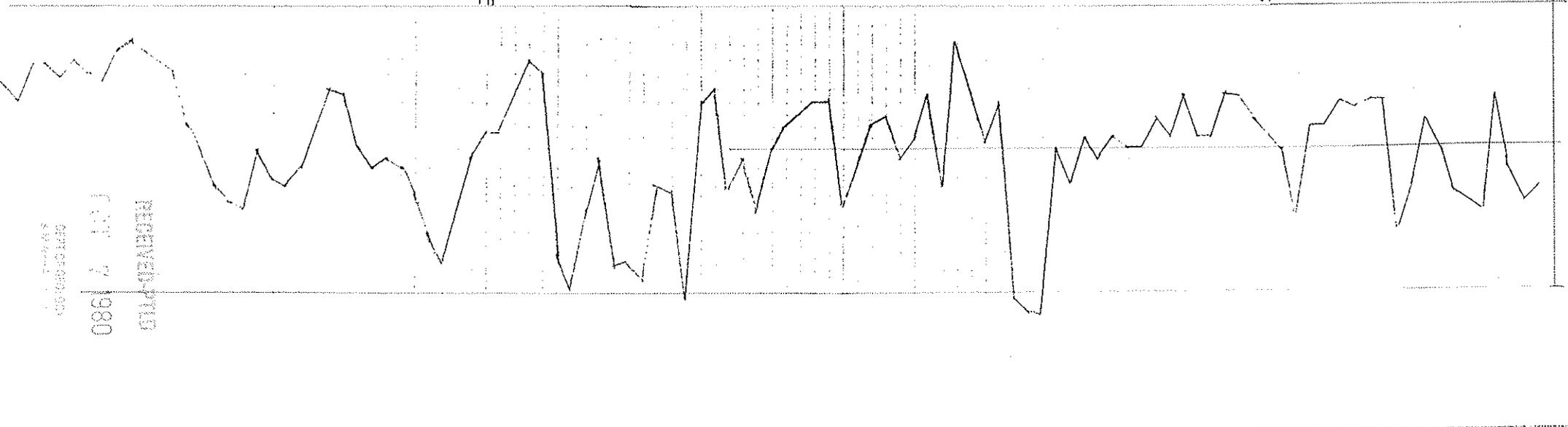
Recovery, %..... 90.0  
 Residue, %..... 10.0  
 Loss, %..... 0

Approximate Recovery  
 300 EP Gasoline, %..... \_\_\_\_\_  
 392 BP Gasoline, %..... \_\_\_\_\_  
 500 EP Gasoline, %..... \_\_\_\_\_

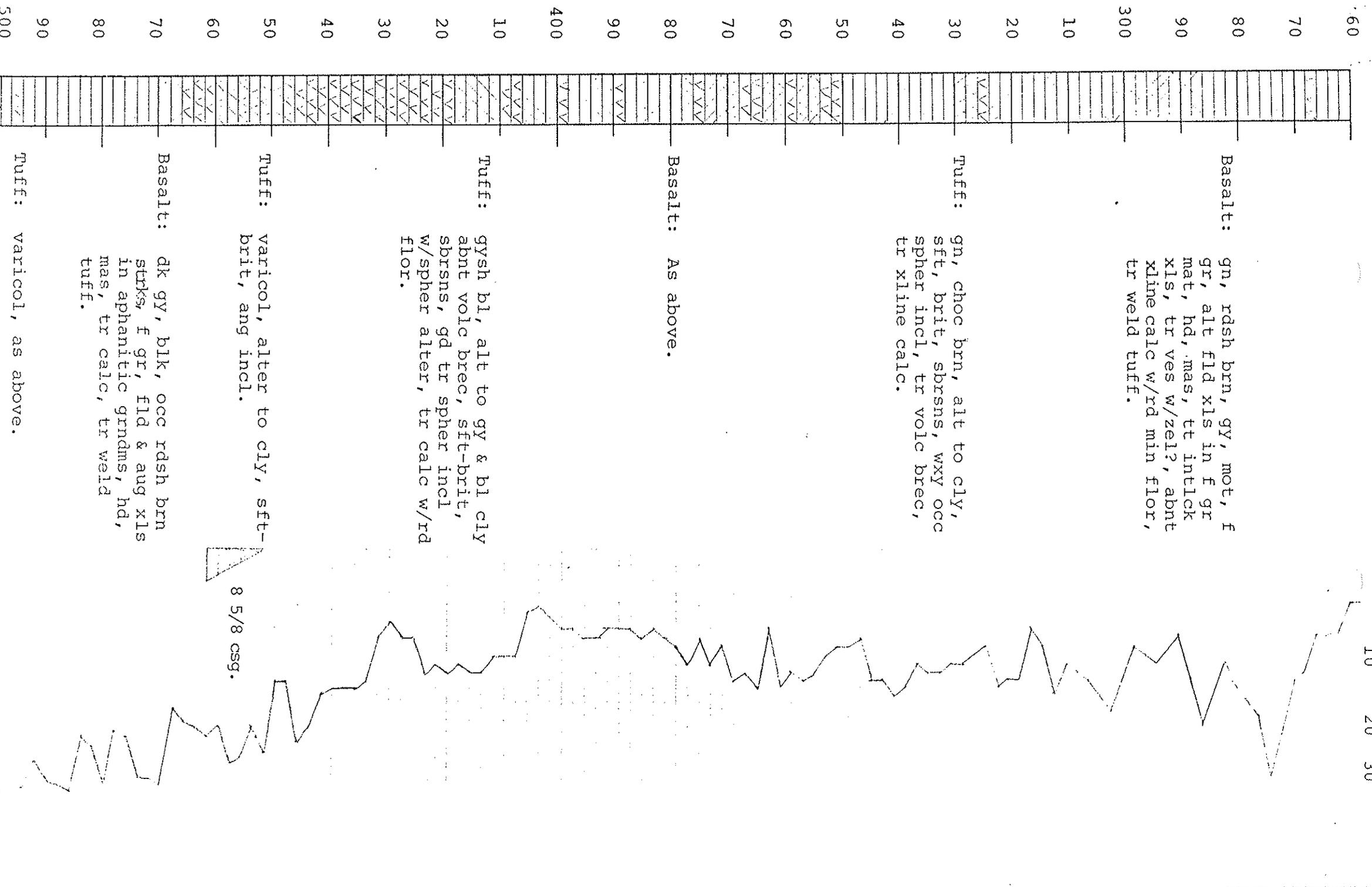
AGGILL OF OREGON  
GRIZZLEY 1

*min/2-ft. penetration*

DEPTH	LITHOLOGY	DESCRIPTION
40	Basalt:	Gy, rdsh brn, f gr w/lrg fld xls, v hd, tt, intlck xls, occ tr vug, tr xline calc, abnt wh & rd tuff.
70	Tuff:	bl-gn, fn-med gr, ang frag in vf gr mtx, tr lapilli tuff, widely alt to cly, tr xline calc w/rd min floor
100	Tuff:	As above, purp & brn.
20	Basalt:	dk gy, f gr, lrg fld xls in fg grndms, v hd, mas, tt, intlck xls, gd tr calc infill of vug & frac.
50	Basalt:	As above.
90	Basalt:	As above tr brn & gn tuff occ w/spher incl.
30	Basalt:	As above w/choc brn & gn intbd tuff, tr vug, gd tr xline calc, tr zeo?



OPERATOR Grizzly Drilling Co. WELL Grizzly #1  
 OPERATIONS Samples  
 DEPTHS  
 LITHOLOGY  
 POROSITY  
 OIL & GAS SHOWS  
 PENETRATION RATE (min/2ft.) FORMATIONS By Penetration  
 LOCATION NE/SW ELEVATION KB  
 Sec. 33-112S-R15E 34541 ft.  
 WIERICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING



Basalt: gn, rdsh brn, gy, mot, f gr, alt fld xls in f gr mat, hd, mas, tt intlck xls, tr ves w/zel?, abnt xline calc w/rd min flor, tr weld tuff.

Tuff: gn, choc brn, alt to cly, sft, brit, sbrsns, wxy occ spher incl, tr volc brecc, tr xline calc.

Basalt: As above.

Tuff: gysh bl, alt to gy & bl cly abnt volc brecc, sft-brit, sbrsns, gd tr spher incl w/spher alter, tr calc w/rd flor.

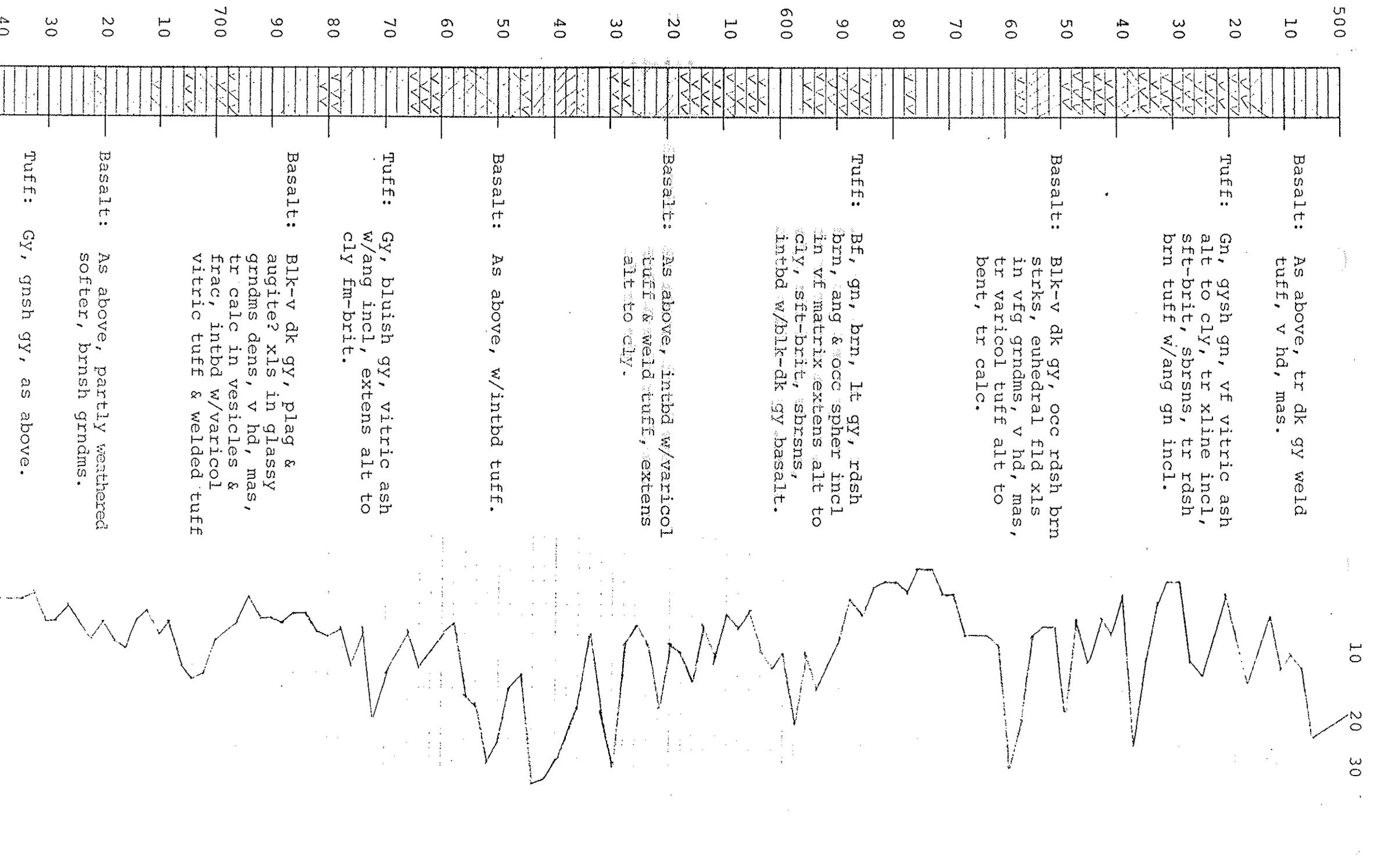
Tuff: varicol, alter to cly, sft-brit, ang incl.

Basalt: dk gy, blk, occ rdsh brn strks, f gr, fld & ang xls in aphanitic grndms, hd, mas, tr calc, tr weld tuff.

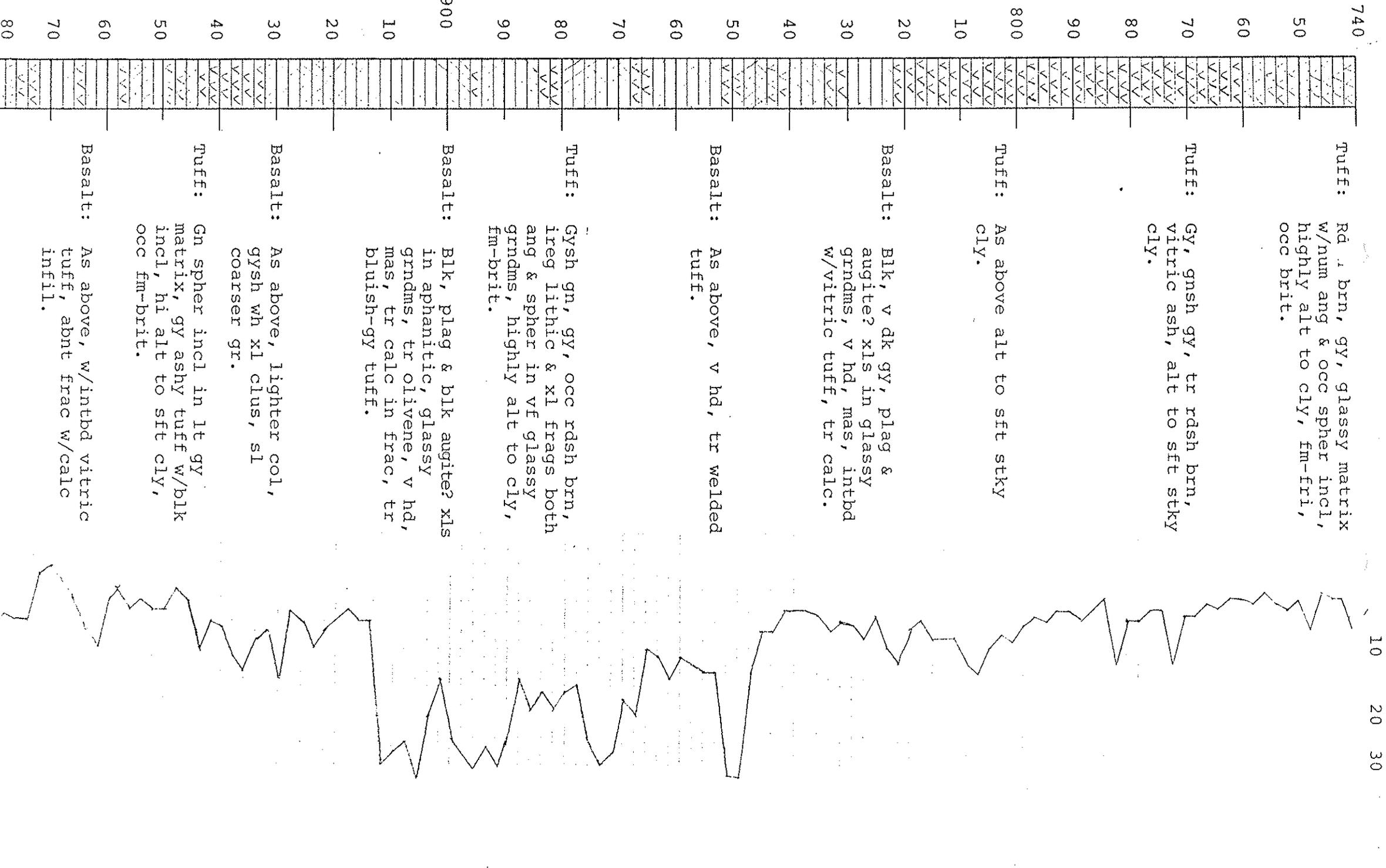
Tuff: varicol, as above.

8 5/8 csg.

OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 ATTRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING  
 SEC. 33-T12S-R15E 3454' (ass'd)



OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION 103  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING Sec. 33-T12S-P15P 3454' (est)  
 FORMATIONS DEPTHS POROSITY OIL & GAS SHOWS PENETRATION RATE FORMATIONS  
 (min/2ft.) By Penetration  
 SAMPLES

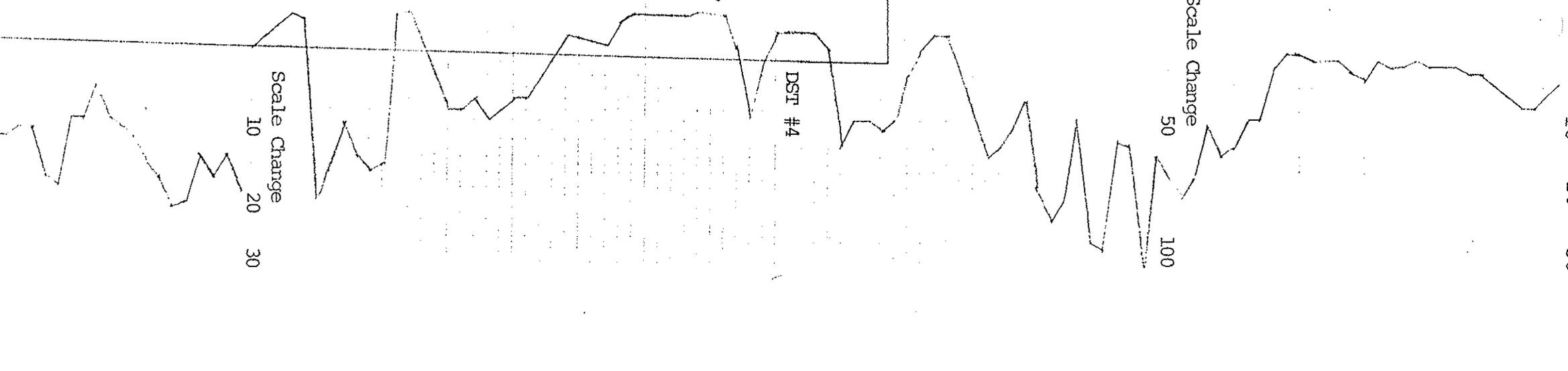


FORMATION DEPTHS LITHOLOGY POROSITY OIL & GAS SHOWS PENETRATION RATE FORMATIONS (min/2ft.) By Penetration

OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION NB

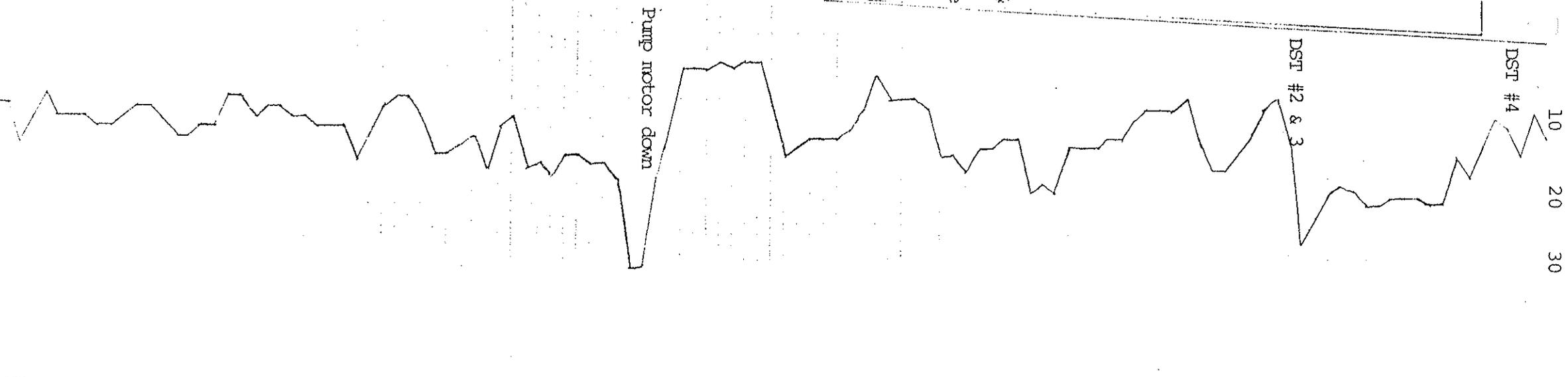
PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING Sec. 33-T12S-R15E 3454' (est)

DEPTH	LITHOLOGY	POROSITY	OIL & GAS SHOWS
980	Tuff: Gr 1 gn, gy, vitric ash, w/xl & glassy incl, hi alt to sft cly.		
90			
1000	Tuff: Rdsh brn & gnsh gy vitric ash hi alt to sft stky cly, occ fm-fri.		
10			
20	Tuff: Brick rd, vitric ash w/gy & gn ang & spher incl, hi alt to sft stky cly.		
30			
40	Basalt: Blk, blk aug? xls in glassy aphanitic grndms, v hd, dens, mas, tr calc.		
50			
60			
70	Basalt: As above, sl coarser gr tr Olivene phenocryst & tr plag, tr vitric tuff w/about spher lapilli.		
80			
90			
1000	Tuff: Lt gy, gy, rdsh brn, lithic & blk xl frags in aphanitic gy vitric grndms alt to cly, frags occ v num, fm-brit, mas, tr calc.		
10			
20			
30	Tuff: Dk gy, blk, tt packed xl & vitric frags, fm-hd, some alt to cly, tr frac por w/ calc infil.		
40			
50	Tuff: Choc brn, occ brick rd, gn & gy, ang frags & shards in glassy grndms, alt to cly, hd-brit, mas, tr conch frac tr calc, wxy lustre.		
60			
70			
80	Tuff: Dk gy, blk, ang xl frags of flds & blk min in vfg grndms, occ spher incl of glass alt to cly, fm-hd, mas, sl alt to cly.		
90			
1200			
10	Tuff: Rdsh brn, gysh gn, alt to cly.		
20			

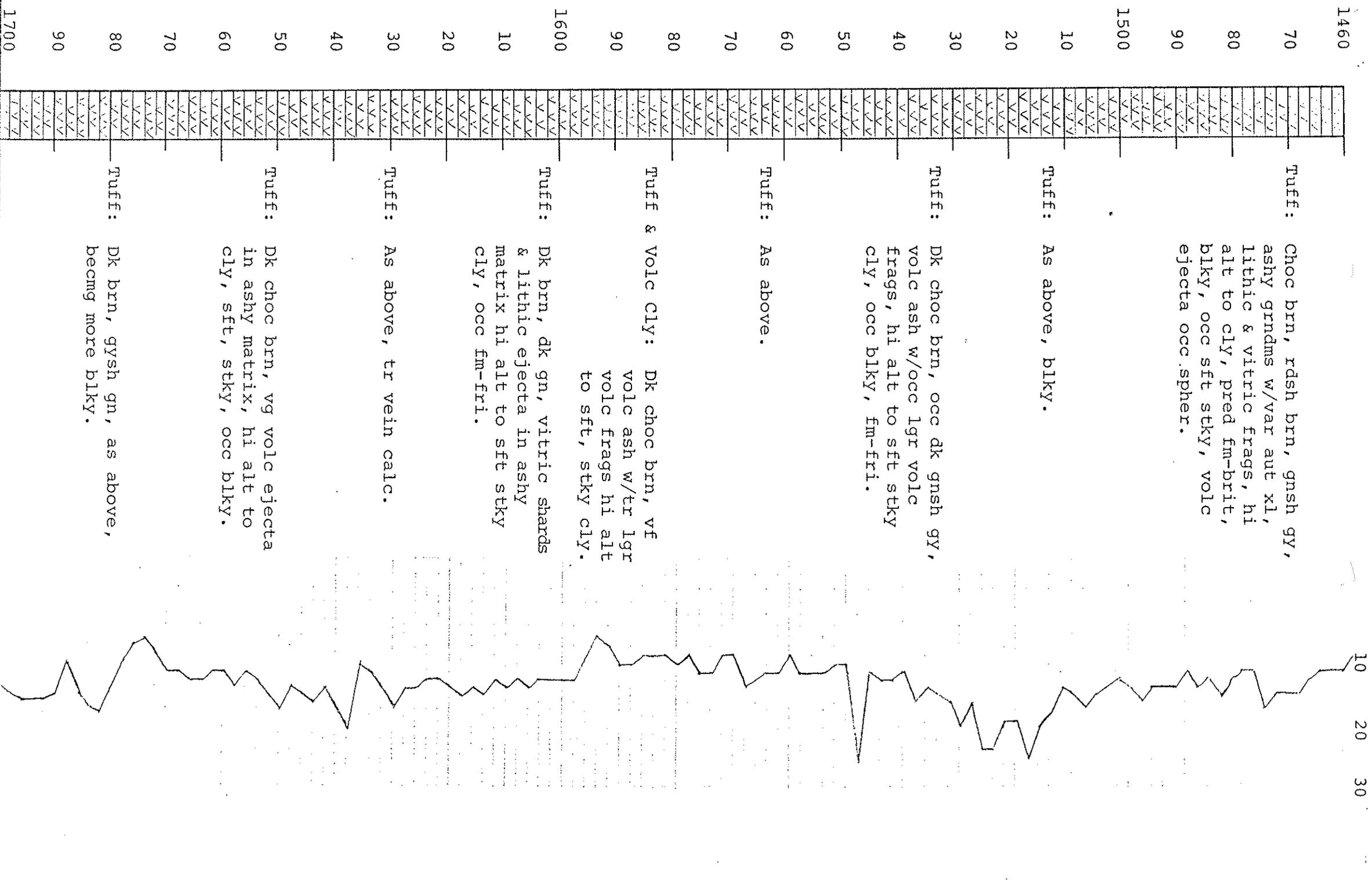


OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 FORMATIONS By Samples 33-7128-115P 3454' (cont)  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING

DEPTHS	LITHOLOGY	POROSITY	OIL & GAS SHOWS
1220			
30	Tuff: Brn, dk gy, dk gn, ang xls & xl frag & glassy shards in vf gr grndms, part to whole alt to cly, fm-brit occ hd, tr brick rd tuфф, tr vfg brn volc Ss.		
40			
50			
60	Tuff: As above w/tr choc brn tuфф alt to cly.		
70			
80			
90	Tuff: Dk gy, weld xl & glassy frags, fm-hd, tr rdsh brn tuфф.		
1300	Tuff: Dk gy, dk gn, occ brick rd & lt gn, lithic & xl frags in glassy grndms, part to whole alt to cly, fm-hd, tr xline calc w/out min flor.		
20			
30			
40	Tuff: Gysh gn, alt to sft stky cly.		
50			
60	Tuff: Choc brn, gn, vitric ash w/ occ ang incl, alt to cly, fm-brit, wxy, tr sft gysh gn cly.		
70			
80			
90	Tuff: Gnsh gy, alt to sft stky cly, tr choc brn tuфф as above.		
1400			
10	Tuff: Choc brn, rdsh brn, gnsh gy, lithic, vitric & xl frags in ashy grndms hi alt to cly, fm-fr, occ sft, stky, blkly.		
20			
30			
40			
50	Tuff: As above, blkly.		
60			



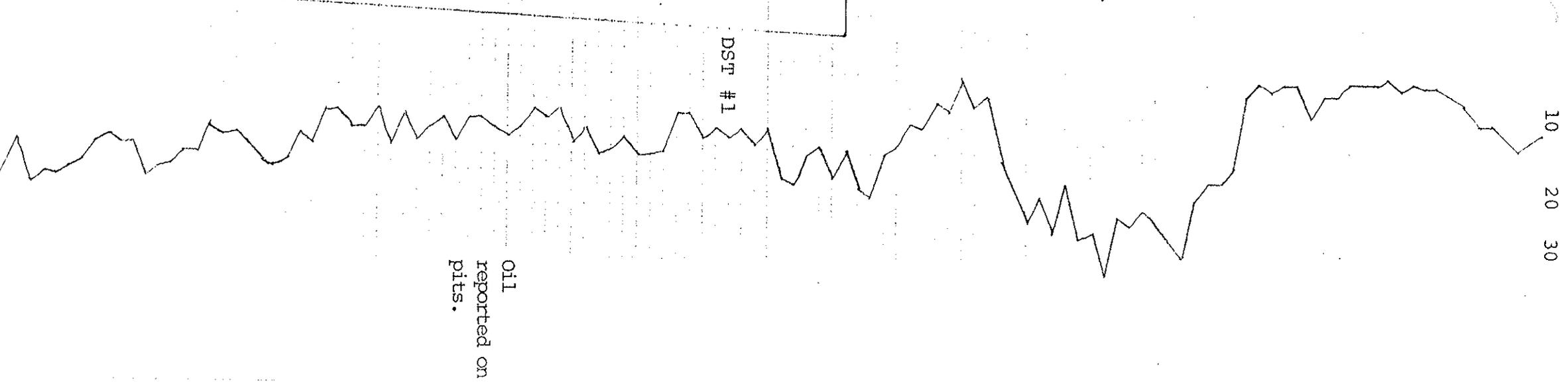
OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING  
 33-1125-D15F 34541 (CSA)  
 FORMATIONS By Samples PENETRATION RATE FORMATIONS By Penetration  
 OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING



OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION RB  
 By Samples FORMATIONS DEPTHS LITHOLOGY POROSITY OIL & GAS SHOWS PENETRATION RATE FORMATIONS  
 (min/2 ft.) By Penetration

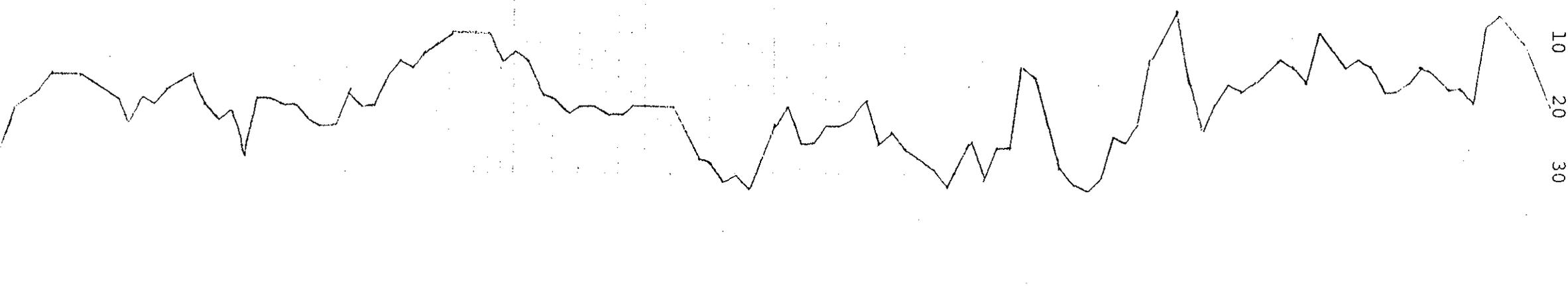
PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING  
 Sec. 33-T12S-R15E 3454' (est)

DEPTH	LITHOLOGY	POROSITY	OIL & GAS SHOWS
1700	Tuff: Dk brn, dk choc brn w/gn incl, hi alt to sft cly, occ fri.		
10			
20			
30	Tuff: Brn, dk gnsh gy, lithic, vitric & xl frags in ash matrix hi alt to cly, sft-fri, wxy lustre.		
40			
50			
60	Welded Tuff: Lt gy, vf vitric & xl frags tightly welded, v hd, occ lgr frags, v sl alt to cly, tr vein calc.		
70			
80			
90	Tuff: Rdsh brn, gn, rd, gy, ang frags in ash matrix alt to cly, wxy lustre, fm-brit, tr calc, tr sks?		
1800			
10			
20			
30	Tuff: Rdsh brn, gn, gysh gn, ang glassy shards, lithic & xl frags in ash matrix, hi alt to cly, fm-brit, occ spher lapilli giving pisoiic & lapilli tufts.		
40			
50			
60			
70	Tuff: Hi vgt'd, wh, rdsh brn, purp bl, gn, gy, pred ang xl & lithic frags in ash matrix hi alt to cly, fm-brit, hydrates & crumbles on contact w/water after initial drying, abnt xline calc, tr pyr, tr zeo.		
80			
90			
1900			
10	Tuff: Brn, rdsh brn, dk gn, purp, gy, as above, abnt xline calc, tr pyr, tr gy s&p volc ss.		
20			
30			
40			



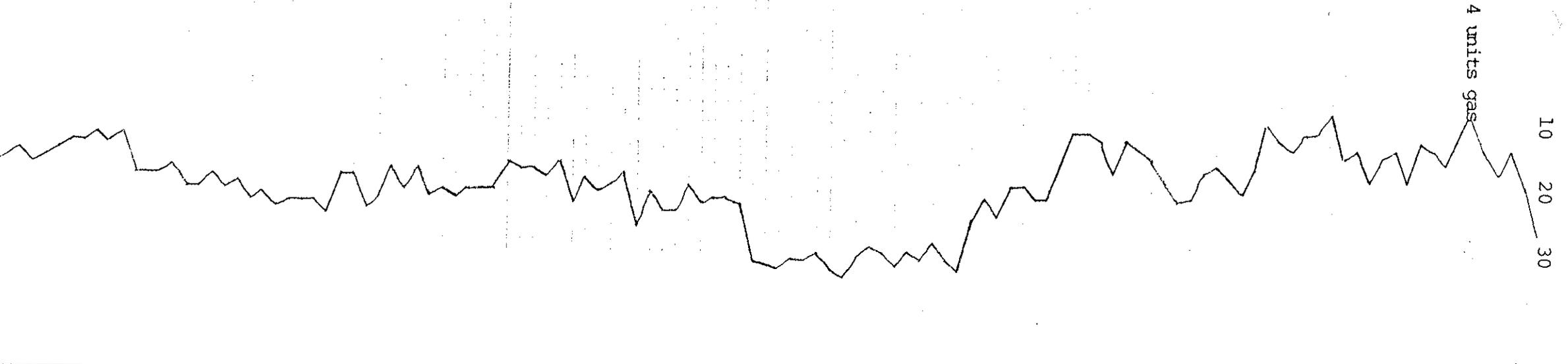
OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 By Samples PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING  
 Sec. 33-T106-R15 R 3454' (act)

FORMATIONS By Samples	DEPTHS	LITHOLOGY	POROSITY	OIL & GAS SHOWS	PENETRATION RATE (min/2ft.)	FORMATIONS By Penetration
1940	50	Tuff: Rdsn brn, gy, gnsh gy, ang lithic, vitric & xl frags in ash matrix, all hi alt to cly, fm-brit, easily scratched w/fingernail, wxy lustre, abnt xline calc, tr zeo.			10	
	60				20	
	70				30	
	80				40	
	90	Calc: Wh xline calc, occ cly, mas, gran, tr pyr where cly, occ sl vuggy.			50	
	2000				60	
	10	Welded Tuff: Lt gy, lt gnsh gy, tightly welded vitric & lithic frags, v hd brit, gd tr vein calc, tr lineation of vitric shards.			70	
	20				80	
	30				90	
	40	Welded Tuff: As above, tr choc brn tuff.			2100	
	50					
	60	Welded Tuff: Gy, lt gy, xl & vitric frags in glassy grndms, tightly welded, v hd, tr lineation of glassy shards & xl laths tr vein calc, rims of some xl frags alt to calc.				
	70					
	80					
	90					
	2100	Welded Tuff: Lt gy, whtsh gy, pred xl frags w/occ lithic frags in glassy grndms tightly welded, v hd tr lineation, g tr vein calc.				
	40	Welded Tuff: As above, tr lt gn, g tr calc.				
	50					
	60	Welded Tuff: Wh xl frags in brn-gysh brn glassy matrix rims of xl frags alt to calc, v hd, g tr vein calc.				
	70					
	80					



OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION FB  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING  
 Sec 33-1125-R15E 3454' (est)

DEPTHS	LITHOLOGY	POROSITY	OIL & GAS SHOWS
2180	Welded Tuuff: As above.		
90			
2200	Tuuff: Lt gy, dk gy, gn, brn, volc ejecta in glassy grndms, hi alt to cly, fm-brit, occ cly, tr welded tuuff.		
10			
20	Tuuff: Gy, lt gy, wh, brn, gn, bl, varicol, lithic, vitric & xl frags & lapilli in ashy grndms, part-wholly alt to cly, fm-sft, g tr hd welded tuuff, tr calc, tr pyr.		
30			
40			
50			
60	Welded Tuuff: Gy, lt gy, xl frags, (Ignimbrite) xl laths & vitric frags in glassy grndms, v hd, tr lineation of xl laths, tr calc.		
70			
80			
90			
2300	Welded Tuuff: As above. (Ignimbrite)		
10			
20	Welded Tuuff: Gy, lt gy, clr field (Ignimbrite) xls & xl frags w/blk xl laths in aphanitic grndms, tightly welded, v hd, tr chal, tr calc.		
30			
40			
50	Tuuff: Gy, brn, gnsh gy, rdsh brn, xl frags & volc ejecta in vf gr ashy grndms, fm-brit, occ hd, tr calc, tr sft stky cly.		
60			
70			
80			
90	Tuuff: As above, rdsh brn.		
2400			
10	Tuuff: Rdsh brn, gy, volc ejecta in aphanitic ashy matrix, alt to cly, tr calc, fm-brit.		
20			



OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING Sec. 33-T12S-R15E 3454' (est)

DEPTH	LITHOLOGY	POROSITY	OIL & GAS SHOWS	PENETRATION RATE (min/2 ft.)	FORMATIONS
2420					
30	Tuff: Rdsh brn, gy, brn, gnsh gy, ang lithic & vitric frags & occ xl frags in vf gr-aphanitic ashy grndms, hi alt to cly, fm-brit, occ sft cly, tr calc, tr chal.			10	
40				20	
50				30	
60					
70	Tuff: As above.				
80					
90	Tuff: Gy, rdsh brn, as above, tr ignimbrite, lt gysh brn.				
2500	Tuff: Brn, rdsh brn, gysh brn, lithic & vitric frags w/occ xl frags in ashy grndms, hi alt to cly, fm-sft, tr ignimbrite.				
20					
10					
30	Welded Tuff: Gy, gnsh gy, xl frags, occ lge, & lithic frags in aphanitic-glassy grndms, tightly welded, v hd, tr calc tr vein qtz, tr lineation of xl laths.				
40					
50					
60					
70	Welded Tuff: As above.				
80	(Ignimbrite)				
90	Welded Tuff: Gy-dk gy, xl frags in aphanitic-glassy grndms, tightly welded, v hd, tr rdsh brn & purp tuff alt to cly, tr lineation of xl frags.				
2600					
10					
20					
30	Tuff: Rdsh brn, choc brn, purp, gn, vitric, lithic & xl frags in f gr ashy matrix, all hi alt to cly, fm-brit, tr calc, tr welded tuff.				
40					
50					
60					

New Bit

OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING Sec. 33-T12S-R15E 3454' (est)

DEPTHS	LITHOLOGY	POROSITY	OIL & GAS SHOWS	PENETRATION RATE (min/2 ft.)	FORMATIONS
2660	Tuff: Rdsh brn, gy, lt gy, purp, brn, xl frags & volc ejecta in f gr-aphanitic ashy matrix, fm-brit, sl-hi alt to cly, tr v hd welded tuff.			10	
90				20	
80				30	
2700					
10	Welded Tuff: Gy-lt gy, gush gy, xl frags in tt welded (Ignimbrite) glassy grndms, tr lineation of wh xl laths, tr br rd min, v hd.				
20					
30					
40					
50	Welded Tuff: As above, lt gysh brn (Ignimbrite) abnt calc.				
60					
70	Tuff: Wh, lt gy, occ clr xl frags in aphanitic grndms, fm-hd, tr alt to cly, tr calc.				
80					
90	Tuff: As above.				
2800					
10	Tuff: Wh, gy, xl frags in vf gr-aphanitic ashy grndms, part alt to cly, fm-hd, tr calc tr gush gy & rdsh brn alt tuff.				
20					
30					
40					
50	Tuff: As above w/welded tuff, lt gysh brn, v hd.				
60					
70	Tuff: Wh, gy, rdsh brn, gush gy, purp, xl & ang lithic & vitric volc ejecta in vf gr ashy matrix, sl-hi alt to cly, fm-brit, occ hd, tr ignimbrite.				
80					
90					
2900					

OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION 3454' (est)  
 By Samples PETROLEUM GEOLOGIST, CASPER, WYOMING Sec. 33-T12S-R15E

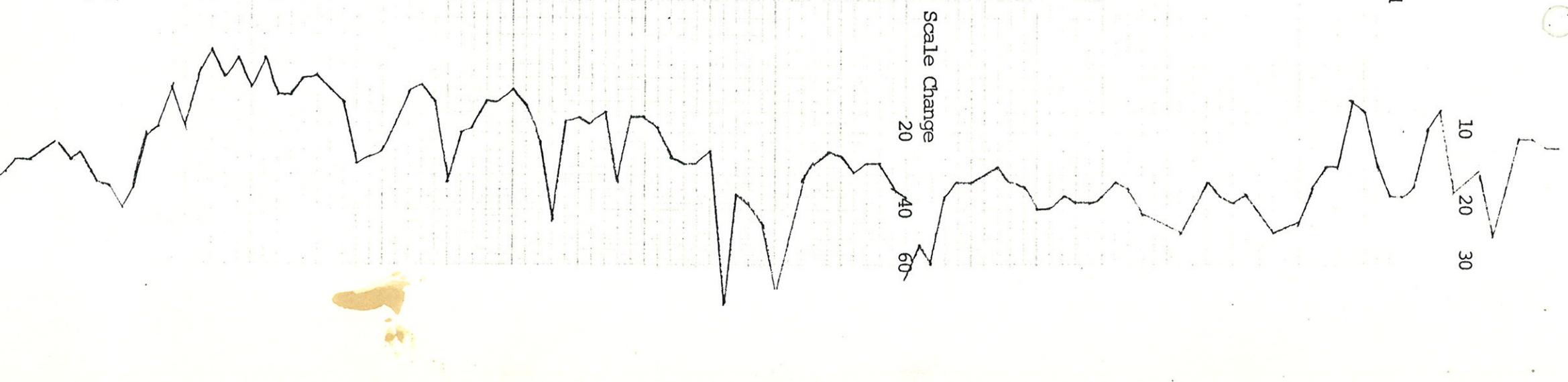
FORMATIONS By Samples	DEPTHS	LITHOLOGY	POROSITY	OIL & GAS SHOWS	PENETRATION RATE (min/2ft.)	FORMATIONS By Penetration
	2900					
	10	Tuff: wh, gy, brn, rdsh brn, gush gy, ang lithic & vitric frags w/occ xl frags in			10	
	20	grndms of aphanitic-vf gr ash, tr ignimbrite, tr calc.			20	
	30				30	
	40					
	50	Welded Tuff: whtsh gy, lt brnsh gy (Ignimbrite)				
	60	ang xl frags & xl laths in aphanitic to glassy grndms, hd-v				
	70	hd, g tr calc, tr chal.				
	80					
	90	Welded Tuff: As above.				
	3000	(Ignimbrite)				
	10	Welded Tuff: Gy-lt gy, xl laths & occ lg xl & vitric frags in glassy grndms, tightly welded v hd, g tr lineation of xl laths, tr calc.				
	20					
	30					
	40	Welded Tuff: As above.				
	50	(Ignimbrite)				
	60	Welded Tuff: As above, g tr calc.				
	70	(Ignimbrite)				
	80					
	90	Tuff: Rdsh brn, olive brn, purp, gy, ang lithic & vitric frags in ashy matrix, alt to cly, fm-brit, tr calc.				
	3100					
	10					
	20	Welded Tuff: Lt gy, lt brnsh gy, (Ignimbrite)				
	30	dnse, aphanitic w/ occ xl frags, v hd, tr calc.				
	40					

OPERATOR Grizzly Drilling Co. WELL Grizzly #1

LOCATION NE/SW ELEVATION (est) 3454m  
 Sec. 33-T12S-R15E

PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING

DEPTHS	LITHOLOGY	POROSITY	OIL & GAS SHOWS
3140			
50	Welded Tuff: (Ignimbrite)	Gy, lt gy, xl frags xl frags & laths & vitric frags in glassy grndms, tightly welded, v hd tr lineation.	
60			
70			
80			
90	Tuff: Brn, gn, wh, purp, volc frags in ashy matrix, hi alt to cly, g tr calc.		
3200			
10			
20	Tuff: Brn, gy, gn as above, tr chal.		
30			
40			
50	Tuff: As above.		
60			
70	Tuff: As above, tr sft wh cly.		
80			
90			
3300			
10	Welded Tuff: (Ignimbrite)	Dk gy, occ xl frags in glassy grndms, v hd, dns, tt weld, tr calc, tr chal.	
20			
30			
40			
50	Welded Tuff: (Ignimbrite)	As above.	
60			
70			
80	Tuff: Brn, rdsh brn, gysh gn, any lithic & vitric frags & occ xl frags in glassy matrix, hi alt to cly, fm-brit, tr calc.		



OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION KB  
 PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING 3454' (est)  
 Sec. 33-T12S-R15E

3380  
90  
3400  
10  
20  
30  
40  
50  
60  
70  
80  
90  
3500  
10  
20  
30  
40  
50  
60  
70  
80  
90  
3600  
10  
20



Tuff: 1, rdsh brn, gysh gn, avg volc ejecta in vf gr ashy matrix, all hi alt to cly, fm-brit, tr calc, tr chal.

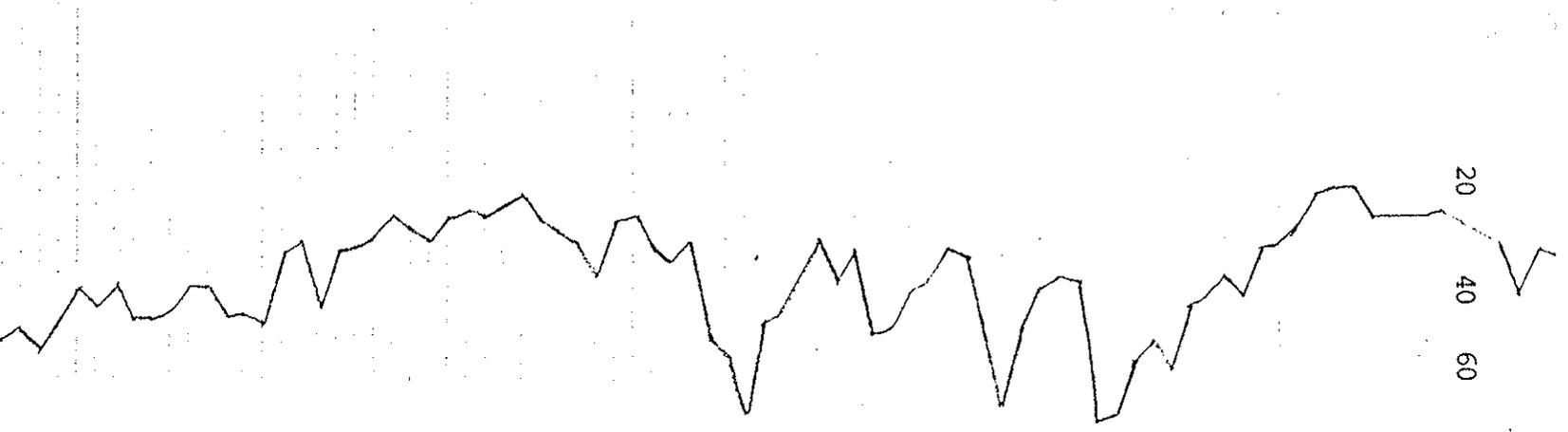
Welded Tuff: Lt gysh brn, occ xl (Ignimbrite) & lithic frags in glassy grndms, v hd, tt welded, dns, tr chal.

Welded Tuff: Lt gysh brn, as (Ignimbrite) above.

Welded Tuff: Lt gysh brn, gy, as (Ignimbrite) above, tr chal.

Tuff: Rdsh brn, gy, gnsh gy, avg volc ejecta, xl, lithic & vitric frags in vf gr ashy matrix, hi alt to cly, fm-brit, occ wxy lustre, tr calc, tr chal.

20 40 60



FORMATIONS By Samples DEPTHS LITHOLOGY POROSITY OIL & GAS SHOWS PENETRATION RATE FORMATIONS (min/2ft.) By Penetration

OPERATOR Grizzly Drilling Co. WELL Grizzly #1 LOCATION NE/SW ELEVATION N2 Sec. 33-T12S-R15E 3454' (est)

PATRICK MCCONIGLEY, PETROLEUM GEOLOGIST, CASPER, WYOMING