

sat	Saturated	Solen	Solenopora	sy-Ca	Sparry calcite	vgt	Variegated
sb	Sub	sp	Spot (led) (ty)	sz	Size	vit	Vitreous
sc	Scales	spec	Speck (led)			vn	Vein
Scaph	Scaphopod	Spig	Sponge	lab	Tabular	voic	Volcanics
scat	Scattered	sph	Spherules	Tas	Tasmanites	vps	Very poor samples
sch	Schist	Sphaer	Sphaerocodium	Tent	Tentaculites	vrtl	Vertical
Scol	Scolecodonta	sphal	Sphalerite	tex	Texture	vrud	Varved
sd	Sand (1/16-2 mm)	spic	Spicule (ar)	Tham	Thamnopora	vug	Vug (gy) (ular)
sdy	Sandy	spl	Sample	thk	Thick		
sec	Secondary	splty	Splintery	thn	Thin	/	With
sed	Sediment (ary)	Spr	Spore	thru	Throughout	w	Well
sel	Selenite	srt	Sort (ed) (ing)	tns	Tension	wh	White
sept	Septate	ss	Sandstone	tr	Trace	wk	Weak
sft	Soft	Stach	Stachyodes	trip	Tripoli (ic)	wthr	Weathered
sh	Shale	stmg	Streaming	trsl	Translucent	wtr	Water
shad	Shadow	stn	Stain (ed) (ing)	trns	Transparent	wvy	Wavy
shy	Shaly	str	Streak	tt	Tight (ly)	wxy	Waxy
sid	Siderite (ic)	strg	Stringer	tub	Tubular		
sil	Silica (eous)	stri	Striated	tuf	Tuffaceous	xbd	Cross-bedded
sk	Slickensided	strom	Stromatopora			xbdg	Cross-bedding
sl	Slight (ly)	stromlt	Stromatolite	uncons	Unconsolidated	xl	Crystal (line)
sln	Solution	struc	Structure	unident	Unidentifiable	xlam	Cross-laminated
slky	Silky	styl	Stylofite (ic)	up	Upper		
slt	Silt	Stylio	Styliolina			yel	Yellow
sltst	Siltstone	sug	Sugary	v	Very		
stly	Silty	surf	Surface	var	Variable	zoo	Zeolite
sm	Smooth	Syring	Syringopora	vcol	Varicolored	zn	Zone
sol	Solitary			ves	Vesicular		

### ENGINEERING ABBREVIATIONS

AOF	absolute open flow	GCM	gas cut mud	perf	perforated
BHFP	bottom hole flow pressure	GCW	gas cut water	PD	per day
BHP	bottom hole pressure	GAP	good air blow	PH	per hour
BHSIP	bottom hole shut in pressure	GIP	good initial puff	pk	packer
BHT	bottom hole temperature	GOR	gas-to-oil ratio	psi	pounds per square inch
BO	barrels of oil	GR	ground		
BOPD	barrels of oil per day	GTS	gas to surface gravity	rec	recovered
BOPH	barrels of oil per hour	gt	gravity	RT	rotary table
brk	brackish	HO	heavy oil	SAB	strong air blow
BW	barrels of water			SGCM	slight gas cut mud
BWPD	barrels of water per day	IAB	initial air blow	SGCW	slight gas cut water
BWPH	barrels of water per hour	IP	initial production	SI	shut in
				SIP	shut in pressure
circ	circulate (ed) (tion)	KB	kelly bushing	SO	show of oil
ck	choke			SO&G	show of oil and gas
comp	completed (tion)	loc	location	SO&W	show of oil and water
crd	cored	LSD	legal subdivision	SOCM	slight oil cut mud
csg	casing			SOCW	slight oil cut water
(D)	development	MCFG	thousand cubic feet of gas	sqz	squeezed
D & A	dry and abandoned	MMCFG	million cubic feet of gas	SSO	slight show of oil
decr	decreasing	MCO	mud cut oil	SW	salt water
DF	derrick floor	MCW	mud cut water	swbd	swabbed
dist	distillate	O&G	oil and gas	T.D.	total depth
dril	driller	O&SW	oil and salt water	TSTM	too small to measure
DST	drill stem test	OC	oil cut	tstg	testing
		OCM	oil cut mud		
est	estimated	OFM	oil flecked mud	V.op	valve open
		op	open		
FTAB	faint air blow	OTD	old total depth	(W)	wildcat
FAB	fair air blow	OTS	oil to surface	WAB	weak air blow
fl/	flowed (ing)	QWDD	old well drilled deeper	WCM	water cut mud
FP	flowing pressure	QWPB	old well plugged back	WIP	weak initial puff
		QWWO	old well worked over	wtr	water
ga	gauged			wtr cush	water cushion
G&OCM	gas and oil cut mud	PB	plugged back		

### MECHANICAL LOG ABBREVIATIONS

BHCS	bore hole compensated sonic caliper	ES	electric	ML	microlog, minilog
Cal	caliper	IES	induction electric	MLL	microlaterolog
CN	compensated neutron	FDL	formation density log	N	Neutron
DI	dual induction log	S	sonic, acoustilog		
DIL	dual induction laterolog	GR	gamma ray	SNP	sidewall neutron porosity log
DLL	dual laterolog	LL	laterolog	SP	spontaneous potential
DL	density log	LL8	laterolog-8	PL	proximity log



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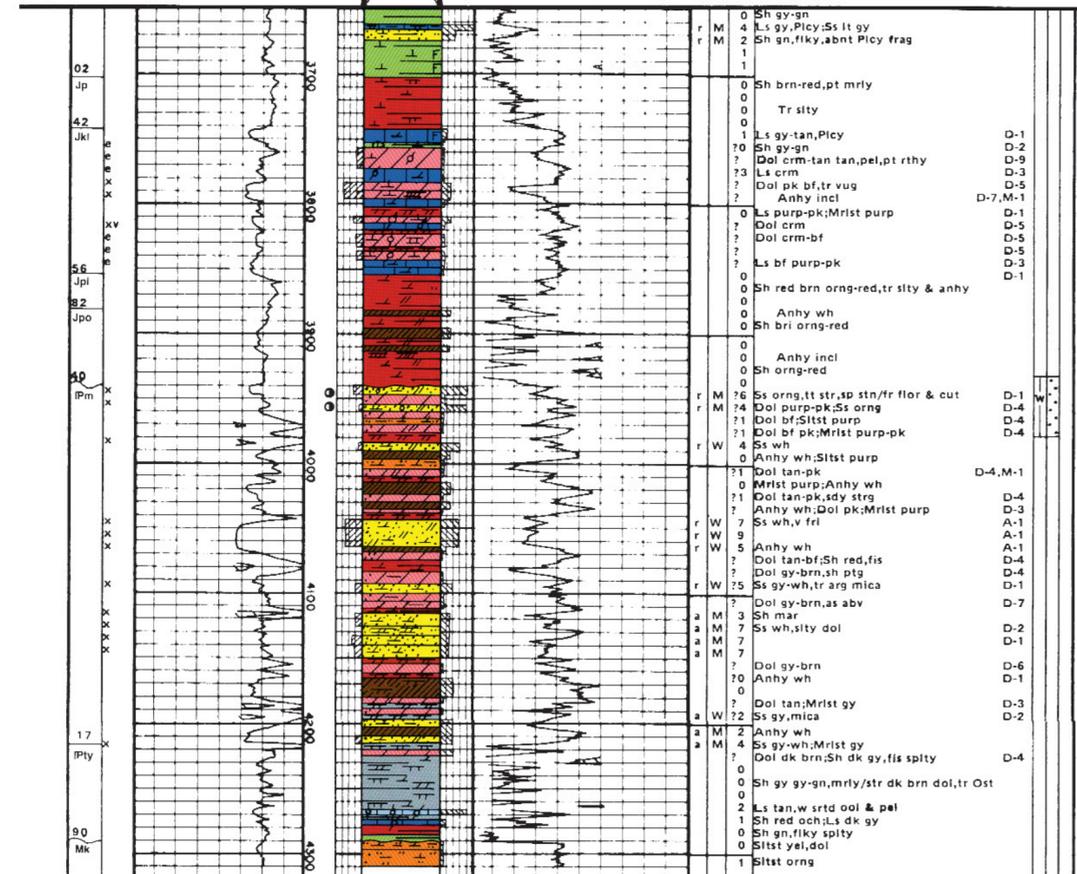
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## LITHOLOGIC SYMBOLS and ABBREVIATIONS



## COMMON ABBREVIATIONS

@	At	coln	Colonial	grnl	Granule (2-4 mm)	num	Numerous
abnt	Abundant	com	Common	grnt	Granite	o	Oil
abv	Above	conc	Concretion (ary)	grnt.w	Granite wash	occ	Occasional
acic	Acicular	conch	Conchoidal	gsy	Greasy	och	Ochre
aft	After	Cono	Conoidal	gy	Gray	od	Odor
aglm	Agglomerate	contm	Contaminated	gyp	Gypsum (iferous)	olvn	Olivine
Alg	Algae (al)	coq	Coquina	gywk	Graywacke	onc	Oncolites
alt	Altered (ing)	Cor	Coral			ooc	Oocast (ic)
amb	Amber	crbnt	Carbonate	hd	Hard	ool	Oolite (ic)
amor	Amorphous	Crin	Crinoid (al)	hem	Hematite (ic)	oom	Oomold (ic)
Amph	Amphipora	crm	Cream	hex	Hexagonal	op	Opaque
amt	Amount	crpxl	Cryptocrystalline	hi	High	org	Organic
ang	Angular	ctd	Coated	hornbd	Hornblend	orng	Orange
anhed	Anhedral	ctc	Contact	hrtl	Horizontal	orth	Orthoclase
anh	Anhydrite (ic)	cvg	Cavings	hvy	Heavy	Ost	Ostracod
app	Appear	CyR	Cypridopsis	hydc	Hydrocarbon	ovgh	Overgrowth
apr	Apparent					ox	Oxidized
aprox	Approximate (ly)	dd	Dead				
arg	Argillaceous	deb	Debris	ig	Igneous	p	Poor (ly)
argl	Argillite	decr	Decrease (ing)	imbd	Imbedded	Para	Paraparchites
ark	Arkose (ic)	dend	Dendrite (ic)	imp	Impression	pbl	Pebble (4-64 mm)
asph	Asphalt (ic)	des	Descript	incl	Included (sion)	p-d	Pressure deformation
		dess	Desiccation	incr	Increase (ing)	pel	Pellet
bar	Barite (ic)	dism	Disseminated	ind	Indurated	Pen	Pentamerus
bcm	Become (ing)	dk	Dark (er)	indst	Indistinct	perm	Permeability
bd	Bed	dns	Dense (er)	intd	Interbedded	pet	Petroleum (iferous)
bdd	Bedded	dol	Dolomite (ic)	intcl	Intraclast (s)	phen	Phenocrysts
bdaye	Birdseye	dolst	Dolostone	intfag	Interfragmental	phos	Phosphate (ic)
bdg	Bedding	drsy	Druse (y)	intrgran	Intragranular	pisol	Pisolite (ic)
Belm	Belemnites	dtrl	Detrital (us)	intgwn	Intergrown	pit	Pitted
bent	Bentonite (ic)			intlam	Interlaminated	pk	Pink
bf	Buff	Ech	Echinoid	intpt	Interpretation	plag	Plagioclase
biocl	Bioclastic	elg	Elongate	intr	Intrusion (ive)	plas	Plastic
biot	Biotite	Endo	Endothyra	intstl	Interstitial	Plyc	Pelecypod
bioturb	Bioturbated	euhed	Euhedral	intv	Intervolcanic	pl	Plant
bit	Bitumen (inuous)	Euryamph	Euryamphipora	intxl	Intercrystalline	plty	Platy
bl	Blue (ish)			ireg	Irregular	pol	Polish (ed)
bldr	Boulder (256 mm +)	f	Fine (ly)	irid	Iridescent	por	Porous (sity)
blk	Black	fau	Fauna	Ivan	Ivanovita	pos	Possible (ility)
blky	Blocky	Fe	Iron-Ferruginous			p-p	Pin point
bnd	Band (ed)	Fe-mag	Ferro-magnesian	kao	Kaolin	pred	Predominant (ly)
boudg	Boudinage	fenst	Fenestral	lam	Laminated	pres	Preserved (ation)
Brac	Brachiopod	Fe-st	Ironstone	lav	Lavender	prim	Primary
brhg	Branching	fib	Fibrous	lchd	Leached	pris	Prism (atic)
brec	Breccia (ted)	fis	Fissile	len	Lentil (ular)	prly	Pearly
bri	Bright	fl	Fill (ed)	lig	Lignite (ic)	prob	Probable (ly)
brit	Brittle	fld	Feldspar (thic)	lith	Lithographic	prom	Prominent (ly)
brd	Bored	flk	Flake	lmm	Limonite (ic)	prphy	Porphyry
brn	Brown	flky	Flaky	lmpy	Lumpy	psdo	Pseudo
Bry	Bryozoa	flor	Fluorescence	flt	Fault (ed)	pt	Part (ly)
bulb	Bulbous	flt	Floating	flt	Floating	ptch	Patch (es)
bur	Burrowed	flt	Faint (ly)	fnt	Faint (ly)	ptg	Parting
		Foram	Foraminifera	fos	Fossil (iferous)	purp	Purple
		fr	Fair	frac	Fracture (ed)	pyr	Pyrite (ic) (ized)
calc	Coarse (ly)	fr	Fair	frag	Fragment (al)	pyrbit	Pyrobitumen
carb	Carbonaceous	frac	Fracture (ed)	fri	Friable	Pyrxn	Pyroxene
Calcsh	Calcisphaera	frag	Fragment (al)	frmwk	Framework	qtz	Quartz
cbi	Cobble (64-256 mm)	fri	Friable	fros	Frosted	qtzc	Quartzose
Ceph	Cephalopod	fus	Fusulinid	fus	Fusulinid	qtzt	Quartzite
cgl	Conglomerate	Fvst	Favosites				
Chae	Chaetetes						
chal	Chalcedony						
Chara	Charophytes						
chit	Chitin (ous)						
chk	Chalk (y)						
chlor	Chlorite						
cht	Chert						
chty	Cherty						
Chtz	Chitinozoa						
cl	Clastic						
cln	Clean						
clr	Clear						
clus	Cluster						
cly	Clay (ey)						
clyst	Claystone						
cmt	Cement (ed)						
cncn	Concentric						
cntr	Center (ed)						
col	Color (ed)						

# LOG FORM

FORMATION TOPS FOOTNOTES		POROSITY TYPES		OIL STAIN		POROSITY GRADES		LITHOLOGY		CRYSTAL GRAIN or FRAGMENT SIZE		ROUNDING		DESCRIPTION		DIAGENESIS	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

## COLUMN 1

**FORMATION TOPS**  $\frac{65}{Kbc}$   
**FOOTNOTES** 1\*  
**FAULTS**  
 Normal  
 Reverse  
 Overturned strata

## COLUMN 2

**POROSITY TYPES**

X INTERCRYSTALLINE, INTERGRANULAR, INTERFRAGMENTAL	O ORGANIC-bridged, intrafossil
ϕ INTEROOLITIC, INTERPELLETOID	F FRACTURE
V VUGGY-voids greater than 1/16mm	e EARTHY-low permeability, crystals less than 1/16mm
P PINPOINT-voids less than 1/16mm	□ FENESTRAL-voids from gas bubbles, shrinkage cracks & birdseye texture
J MOLDIC	

## COLUMN 3

**OIL SHOWS**  
**STAIN PRESENT**

● Even staining, fluoresces in solvent	■ Oil zone(from production data)
○ Spotted staining, fluoresces in solvent	▲ Gas zone(from production data)
D Dead, asphaltic, bitumen, etc.	
○ Questionable, no fluorescence in solvent	

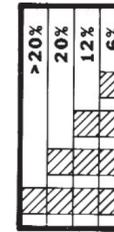
**NO STAIN PRESENT**

## COLUMN 4

### POROSITY GRADES

**FOUR DIVISIONS — (right to left)**

Division 1 3% — 6% Poor porosity with low permeability  
 Division 2 6% — 12% Fair porosity  
 Division 3 12% — 20% Good porosity  
 Division 4 OVER 20% Excellent porosity



## COLUMN 5

### ROCK TYPE

	BRECCIA		CHERT, tripellitic		AMPHIPORA
	CONGLOMERATE		ARGILLACEOUS SHALE, laminae		CORAL
	SANDSTONE		CARBONACEOUS FLAKES		STROMATOPOROID
	SILTSTONE		COAL, thin beds		BRYOZOA
	SHALE, gray		CEMENTING BITUMENOUS SUBSTANCE		BRACHIOPOD
	SHALE, black		CALCAREOUS		OSTRACOD
	SHALE, colored		MARLSTONE, stringers-calc.		CEPHALOPOD
	CLAYSTONE, gray		LIMESTONE, stringers		GASTROPOD
	CLAYSTONE, colored		DOLOMITIC		SCAPHOPOD
	BENTONITE		MARLSTONE, stringers-dol.		BELEMNITE
	CHERT, bedded		DOLOMITE, stringers		ECHINOID
	MARLSTONE, calcareous		ANHYDRITIC		FOSSILS < 20%
	LIMESTONE, mudsupported (FW < 7)		ANHYDRITE, stringers		ORGANIC or NON ORGANIC
	LIMESTONE, grain supported (FW 7 or >)		GYPSIFEROUS		OOLITES
	MARLSTONE, dolomitic		GYPSUM, stringers		PISOLITE 2mm. or over
	DOLOMITE, primary		SALT CAST or INFILL		PELLETS
	DOLOMITE, secondary		PHOSPHATE PELLETS		INTRACLASTS
	SIDERITE, LIMONITE, or HEMATITE		FERRUGINOUS GRAINS or PELLETS		FRAMEWORK ALGAE
	ANHYDRITE, primary		FERRUGINOUS		SKELETAL
	ANHYDRITE, secondary		FERRUGINOUS, stringers		OOTOID
	GYPSUM		NODULES		
	SALT		TUFFACEOUS		
	COAL, pure and interbedded				
	GLACIAL TILL				
	IGNEOUS, basic				
	IGNEOUS, acidic				
	TUFF				
	WELDED TUFF				
	METAMORPHIC				

### SYMBOLS USED FOR SIGNIFICANT OCCURRENCES (may be less than 5%)

	HEAVY, DARK MINERALS
	GLAUCONITE
	BENTONITE
	PYRITE
	KAOLIN
	PLANT SPORES
	PLANT REMAINS
	FISH REMAINS
	MINERAL CRYSTALS

### ROCK BUILDERS

F < 20%	2 symbols = 50 to 70%
1 symbol = 20 to 50%	3 symbols = 70 to 100%

### ORGANIC

	FORAMINIFERA
	CRINOID
	PELECYPOD
	BIOLASTIC or FRAGMENTAL

### AMPHIPORA

	AMPHIPORA
	CORAL
	STROMATOPOROID
	BRYOZOA
	BRACHIOPOD
	OSTRACOD
	CEPHALOPOD
	GASTROPOD
	SCAPHOPOD
	BELEMNITE
	ECHINOID
	FOSSILS < 20%

	ORGANIC or NON ORGANIC
	OOLITES
	PISOLITE 2mm. or over
	PELLETS
	INTRACLASTS

### FRAMEWORK ALGAE

	SKELETAL
	OOTOID

### NON-FRAMEWORK ALGAE

	NON-DESCRIPT
	LAMINATED

### MISCELLANEOUS

	KARST TOPOGRAPHY
	NO SAMPLES
	CANNOT INTERPRET, cavings etc.
	QUESTIONABLE INTERPRETATION

### TEXTURES

	EARTHY
	CHALKY
	LITHOGRAPHIC
	CRYPTOCRYSTALLINE

## COLUMN 6

### CRYSTAL, GRAIN or FRAGMENT SIZE

#### FIVE DIVISIONS (left to right) WENTWORTH SCALE

Division 1 .004mm — .0625mm Silt  
 Division 2 .0625mm — .125mm Very fine  
 Division 3 .125mm — .250mm Fine  
 Division 4 .250mm — .500mm Medium  
 Division 5 .500mm — 1.000mm Coarse



## COLUMN 7

### ROUNDING

A ANGULAR R ROUNDED  
 a SUBANGULAR r SUBROUNDED

## COLUMN 8

### SORTING

W WELL 1 or 2 sizegrades  
 M MEDIUM 3 or 4 sizegrades  
 P POOR 5 or more sizegrades

## COLUMN 9

### FRAMEWORK

FRAMEWORK IS A RATIO BETWEEN PARTICLE OR CLASTIC MATERIAL OVER 1/16mm AND PRIMARY VOID FILLER OR MATERIAL 1/16mm AND LESS.

0 0 to 5%	5 50%	C 100%
1 10%	6 60%	?5 QUESTIONABLE INTERPRETATION
2 20%	7 70%	? UNINTERPRETABLE
3 30%	8 80%	
4 40%	9 90%	

## COLUMN 10

### DESCRIPTION

USED FOR INFORMATION THAT CANNOT BE PRESENTED IN COLUMNS 1 THROUGH 9, E.G. COLOR, SPECIFIC FOSSIL IDENTIFICATION, OBSERVATIONS ON BEDDING, INDURATION, HARDNESS, STRUCTURE, ETC.  
 DESCRIPTIVE TERMS ARE ABBREVIATED. (see abbreviation list)

### DIAGENESIS To the right of written description

TYPE	P PRESSURE DEFORMATION
M METASOMATISM	SECONDARY CEMENTATION
D DOLOMITIZATION	A ANHYDRITE
R RECRYSTALLIZATION	S SILICA
F FRACTURING	K KAOLIN
L LEACHING	C CALCITE and OTHERS

### DEGREE

1 10%	5 50%	9 90%
2 20%	6 60%	C 100%
3 30%	7 70%	? Uninterpretable
4 40%	8 80%	

## COLUMN 11

### DRILL STEM & WIRELINE TEST RESULTS

	GAS RECOVERY
	OIL RECOVERY
	WATER RECOVERY
	GAS, OIL & WATER RECOVERY

## COLUMN 12

### DRILL STEM & WIRELINE TEST INTERVALS

	DRILL STEM TEST INTERVAL
	WIRELINE TESTED ZONE

## COLUMN 13

### CORED INTERVALS

	CORED INTERVAL
	SIDEWALL CORE