PASON SYSTEMS USA CORP.
16080 Table Mountain Parkway
Suite 500
Golden, CO 80403 U.S.A.
(720) 880-2000

LOG created using LPLOT Version 2.77, Oct 7 1999, Copyright (C) Pason USA Corporation, 1994-1999

OPERATOR: NW NATURAL GAS
WELL: I/W 14DH-23-65
LOCATION: SW SEC. 23, T6N, R5W
COUNTY: COLUMBIA
STATE: OREGON
SPOT: SW CORNER, 976.5'N, 1256.3'E
ELEVATION: GL: 905', KB:
FIELD: REICHHOLD POOL DEVELOPMENT

SPUD DATE: OCTOBER 12, 2001
TD DATE: OCTOBER 25, 2001
DATES LOGGED: 10/12/01 - 10/26/01
DEPTHS LOGGED: 43' - 3031'
LOGGERS: SCOTT FIELD & JAMES WILSON
DRILLING FLUID: LSND
DRILLING RIG: TAYLOR RIG #4

LOG TYPE: MUD LOG

SCALE: 1:240 (5.0 INCH/100 FT)

REMARKS:

LITHOLOGIES

SANDSTONE	SILTSTONE	SHALE	COAL	BENTONITE
LIMESTONE	DOLOMITE	ANHYDRITE	CHERT	SALT
CONGLOMERATE	TUFF	ALLUVIUM	METAMORPHIC	GLACIAL TILL
DARK CHERT	WELDED TUFF	ARGILLACEOUS LIMESTONE	LIME MUDSTONE	CRYSTALLINE LIMESTONE
LIME BOUNDSTONE	LIME GRAINSTONE	LIME PACKSTONE	LIME WACKESTONE	DOLOMITIC LIMESTONE
CALCAREOUS DOLOMITE	ARGILLACEOUS DOLOMITE	DOLOMITIC MUDSTONE	CRYSTALLINE DOLOMITE	DOLOMITIC BOUNDSTONE
DOLOMITIC GRAINSTONE	DOLOMITIC PACKSTONE	DOLOMITIC WACKESTONE	SHALY SANDSTONE	CLAYSTONE
GRAY CLAYSTONE	COLORED CLAYSTONE	VOLCANICS	BRIGHT COAL	INTERMEDIATE COAL
DULL COAL	COALY SHALE	NON COAL	GRANITE	BRECCIA
MARL	DOLOMITIC MARL	CARBONACEOUS SHALE	CHALK	GYPSUM
UNABLE TO INTERPRET	NO SAMPLE	BLACK SHALE	COLORED SHALE	GRAY SHALE

▤ SILTY SHALE	SHALY SILTSTONE

MODIFIERS

Ⅲ ANHYDRITE STRINGERS	◠ ALGAE, LAMINATED	ALGAE, NON-DESCRIPT	ALGAE, ONCOID	ALGAE, SKELETAL	▬ AMPHIPORA
// ANHYDRITIC	▬ ARGILLACEOUS	/ ARGILLITE GRAIN	BELEMNITE	B BENTONITE	⌒ BIOCLAST FRAGMENTAL
◇ BRACHIOPOD	BRECCIA	ϒ BRYOZOA	⊥ CALCAREOUS	■ CARBONACEOUS FLAKES	◣ CEMENTING BITUMINOUS
CEPHALOPOD	▲ CHERT, DARK	△ CHERT, LIGHT	⊠ CHERT, TRIPOLITIC	■ COAL	CORAL
⊙ CRINOID	✳ CRYSTALS	DOLOMITE STRINGERS	∠ DOLOMITIC	♡ ECHINOID	+ FELDSPAR
FERRUGINOUS	● FERRUGINOUS GRAINS	FERRUGINOUS STRINGERS	FISH REMAINS	FORAMINIFERA	F FOSSILS
FRACTURES	△ GASTROPOD	∿ GLAUCONITE	\\ GYPSIFEROUS	GYPSUM STRINGERS	HEAVY/DARK MINERALS
INTRACLASTS	K KAOLIN	Ⅱ LIMESTONE STRINGERS	L LIMONITE	Π MARLSTONE, CALCAREOUS	Π MARLSTONE, DOLOMITIC
◡ MICACEOUS	NODULES	ϕ OOLITES	OSTRACOD	PEBBLES	▽ PELECYPOD
ø PELLETS	● PHOSPHATE PELLETS	-o- PISOLITE	PLANT REMAINS	P PYRITE	⊞ SALT CAST/INFILL
o SAND GRAINS	⊡ SANDSTONE STRINGERS	⁚ SANDY	SCAPHOPOD	— SHALE LAMINAE	∧ SILICEOUS
⊡ SILTSTONE STRINGERS	▪▪ SILTY	SLICKENSIDE	S SPORES	Ⅲ STROMATOPOROID	STYLOLITE
V TUFFACEOUS					

POROSITY/SORTING/ROUNDNESS SYMBOLS

X INTERCRYSTALLINE INTERGRANULAR	V VUGGY	F FRACTURE	ϕ INTEROOLITIC	P PINPOINT	ʖ ORGANIC
O MOLDIC	e EARTHY	□ FENESTRAL			
A ANGULAR	a SUBANGULAR	R ROUNDED	r SUBROUNDED		
W WELL	M MEDIUM	P POOR			

ENGINEERING SYMBOLS

BIT CHANGE	∧ LOST CIRCULATION	◢ CASING	◣ CASING	◀ SIDEWALL CORE	▶ SIDEWALL CORE
▷ WIRELINE TEST	◁ WIRELINE TEST	GAS TO SURFACE	OIL TO SURFACE	WATER TO SURFACE	● EVEN STAINING
◐ SPOTTED STAINING	D DEAD OIL	○ QUESTIONABLE	● OIL SHOW	☼ GAS SHOW	✸ OIL AND GAS SHOW
(CG) CONNECTION GAS	(TG) TRIP GAS	MIDNIGHT DEPTH	MIDNIGHT DEPTH	CONNECTION	— OFF BOTTOM
NORMAL FAULT	REVERSE FAULT	OVERTURNED STRATA			

▨ CORE RECOVERED	☐ CORE LOST	☐ DST INTERVAL	☐ ROTATING	▥ SLIDING	■ CANISTER

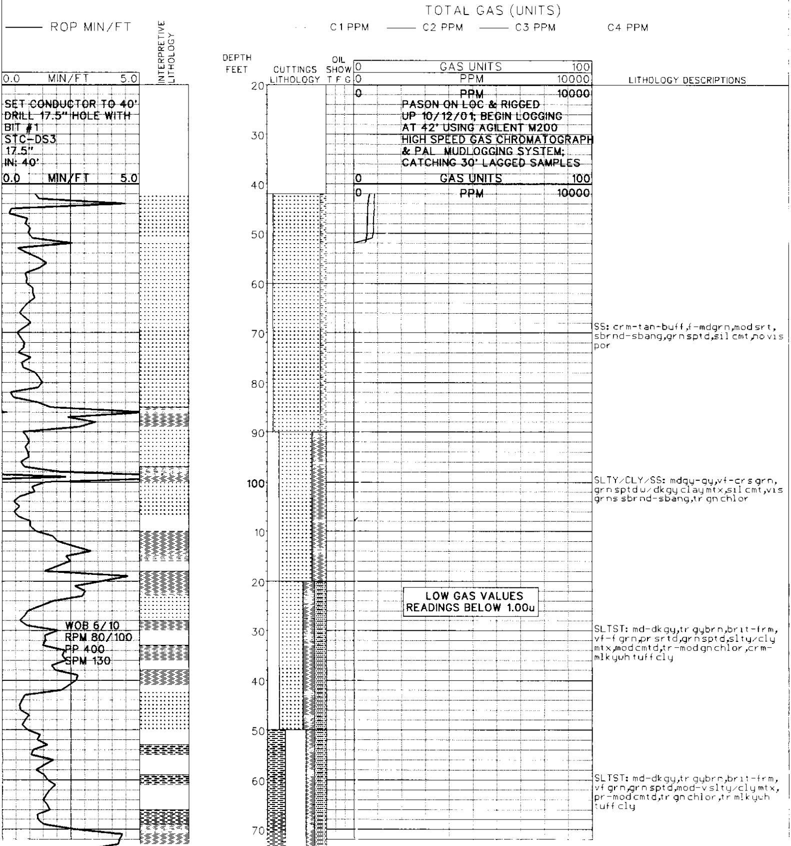
ABBREVIATIONS

CB – CORE BIT
CG – CONNECTION GAS
CO – CIRCULATE OUT
SPM – STROKES/MIN

DST – DRILL STEM TEST
DTG – DOWNTIME GAS
LAT – LOGGED AFTER TRIP
TG – TRIP GAS

NR – NO RETURNS
NS – NO SAMPLE
PP – PUMP PRESSURE
WOB – WEIGHT ON BIT

RPM – REVOLUTIONS/MIN
RR – RE–RUN
SLM – STEEL LINE MEASURE



SET CONDUCTOR TO 40'
DRILL 17.5" HOLE WITH
BIT #1
STC-DS3
17.5"
IN: 40'

PASON ON LOC & RIGGED
UP 10/12/01; BEGIN LOGGING
AT 42' USING AGILENT M200
HIGH SPEED GAS CHROMATOGRAPH
& PAL MUDLOGGING SYSTEM;
CATCHING 30' LAGGED SAMPLES

LOW GAS VALUES
READINGS BELOW 1.00u

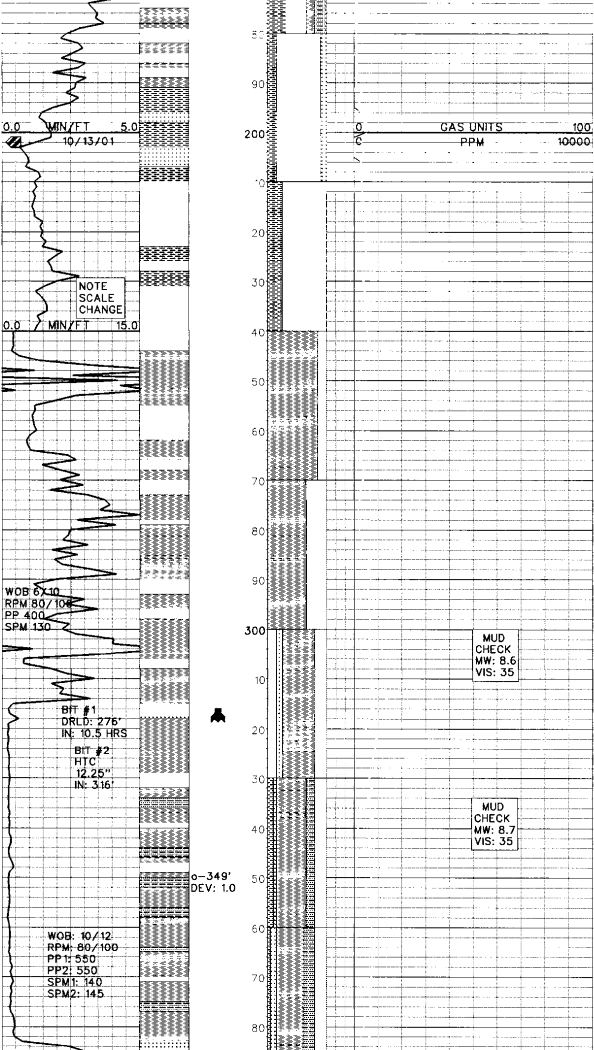
WOB 6/10
RPM 80/100
PP 400
SPM 130

SS: crm-tan-buff,f-mdgrn,mod srt, sbrnd-sbang,grn sptd,sil cmt,no vis por

SLTY/CLY/SS: mdgy-gy,vf-crs grn, grn sptd w/ dkgy clay mtx,sil cmt,vis grns sbrnd-sbang,tr gn chlor

SLTST: md-dkgy,tr gybrn,brit-frm, vf-f grn,pr srtd,grn sptd,slty/cly mtx,mod cmtd,tr-mod gn chlor,crm-mlkywh tuff cly

SLTST: md-dkgy,tr gybrn,brit-frm, vf grn,grn sptd,mod-v slty/cly mtx, pr-mod cmtd,tr gn chlor,tr mlkywh tuff cly



SLTST: ltbrn,lt-dkgy,tan,crm,tan,v sft,ncalc,sbang-sbrnd gr clast incl,v sandy ip,v shly ip,occ grdng to shly sltst and sndy sltst

SLTST: ltbrn,lt-dkgy,tan,crm,v sft, ncalc,sbang-sbrnd gr clast incl,v sandy,grty,abndt shale ip,andt ss gr incl,occ grdng to slty sh and slty ss

CLYST: pred blugy,occ ltgy,gy,occ dkgy,v slty,ncalc,occ ss gr incl, grty,rthy,sbrnd to rnd ss gr clasts incl,occ shly,occ mica ip,ashy,pred wash out

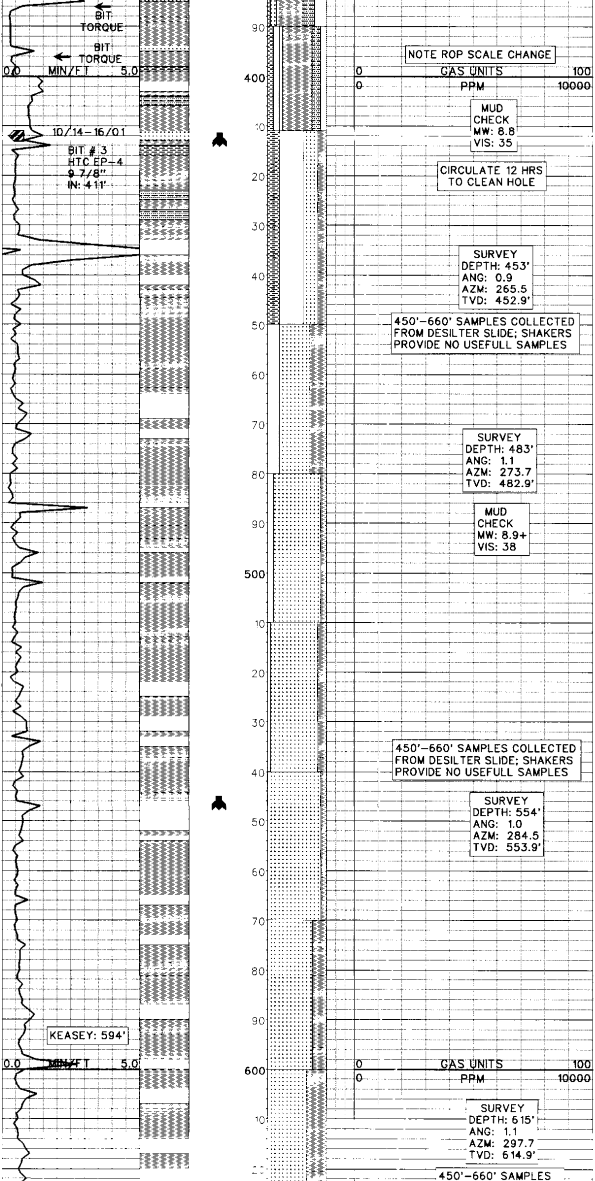
CLYST: gy-mdgy-blugy,occ dkgy,v slty,n-calc,sndy ip,occ shly,ashy ip,cly spl washes out of sieve readily

CLYST: aa,gy-mdgy-blugy,v slty, incre sndy mats,shly ip,contd cly spl washes out of sieve readily; tr SS: few clr qtz grns w/ mod ark gy-gybrn grns,sli-mod calc,pr srtd,vf-crs grn,mica ip

TOH FOR SMALLER DIAMETER BIT; DRILL PILOT HOLE TO CASING DEPTH; LATER REAM OUT WITH NEW 17.5" BIT

CLYST: aa; SLTYSH: gy,mdgybrn, sbplty-sbrnd,arg ip,pred sltst grdg to sh ip,vf-gr,vsli-calc,grty

CLYST: gy-mdgy-blugy,occ dkgy,v slty,n-calc,occ shly; tr SS: ark gy-gybrn grns,sli-mod calc,vf-crs grn, pr srtd,tr mica; SLTYSH: gy,mdgybrn, sbplty-sbrnd,arg,pred sltst grdg to sh ip,vf-gr,vsli-calc,grty



NOTE ROP SCALE CHANGE

CLYST: aa,gy-mdgy-blugy,occ dkgy, v slty,n-calc,occ shly; SLTYSH: aa, gy,mdgybrn,occ blugy,sbplty,slty & sndy thru,vf-m gr,vsli-calc,grty

MUD CHECK
MW: 8.8
VIS: 35

TOH; RIH W/ NEW 17.5" BIT AND REAM LAST 97'; THEN PREP HOLE FOR SURFACE CASING @ 411.5'

CIRCULATE 12 HRS TO CLEAN HOLE

SS: clr,trnsp,trnsl,lt gy,gy,ltbrn, vf-f gr,w srtd,sbrnd,mod-g vis por,n calc,qtz cmt,abndt qtz gr,abndt sltst ip,abndt sh ip,most sltst washes out,NFSOC

SURVEY
DEPTH: 453'
ANG: 0.9
AZM: 265.5
TVD: 452.9'

450'-660' SAMPLES COLLECTED FROM DESILTER SLIDE; SHAKERS PROVIDE NO USEFULL SAMPLES

SS: clr-trnl-trnsp qtz gr,vf-gr,vw-srtd,sbrnd-sbang,gr sptd,cly mtx, slty ip,grdg to sndy mudst

SURVEY
DEPTH: 483'
ANG: 1.1
AZM: 273.7
TVD: 482.9'

MUD CHECK
MW: 8.9+
VIS: 38

SS: abnt lse clr-trnsp-trnsl qtz grs,vf-gr,vw-srtd,sbang,cont gr spt w/ tr residual cly mtx,n-sli calc,no vis cmt,NOS

SS: aa,abnt lse clr qtz grs,occ trnsp-trnsl,vf-gr,vw-srtd,sbang, cont gr spt w/ tr residual cly mtx,n-sli calc,no vis cmt,NOS

450'-660' SAMPLES COLLECTED FROM DESILTER SLIDE; SHAKERS PROVIDE NO USEFULL SAMPLES

TOH FOR DIRECTIONAL TOOLS

SURVEY
DEPTH: 554'
ANG: 1.0
AZM: 284.5
TVD: 553.9'

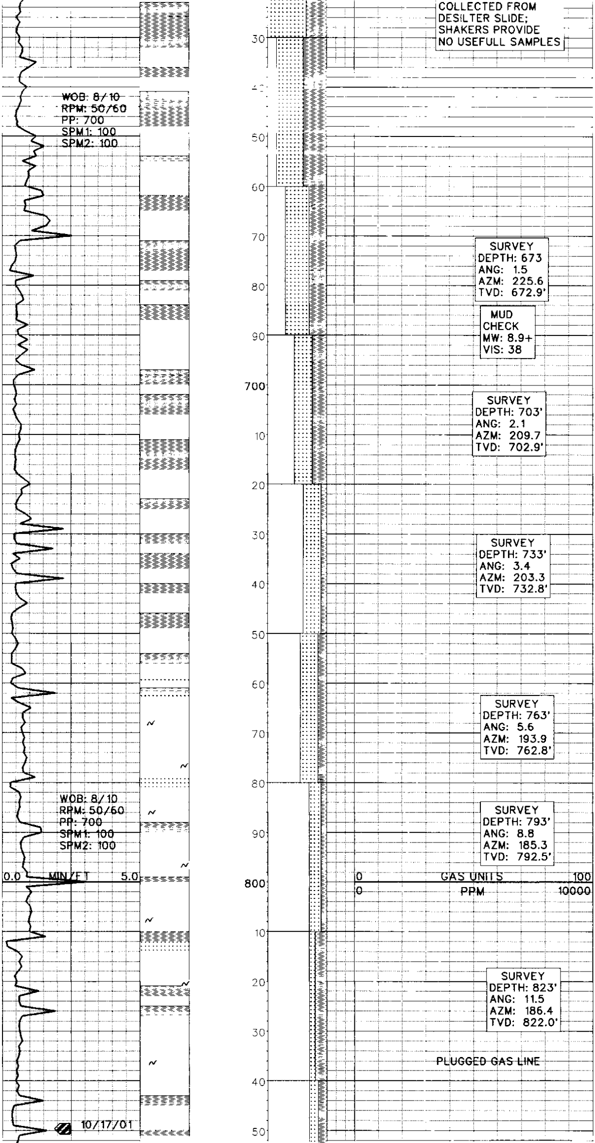
cont'd SS: aa

SS: abnt lse clr w/ mod trnsl-trnsp qtz grs,vf-gr,vw-srtd,sbang,incr cly mtx,no vis cmting; grdg to sndy CLYST: tan-buff,vltbrn,sft,sltyip

SURVEY
DEPTH: 615'
ANG: 1.1
AZM: 297.7
TVD: 614.9'

SNDYCLYST: tan-buff-vltbrn,sft- [illegible]

450'-660' SAMPLES



COLLECTED FROM
DESILTER SLIDE;
SHAKERS PROVIDE
NO USEFULL SAMPLES

SS: [illegible] sbang,grdg to snd, CLYST: aa

WOB: 8/10
RPM: 50/60
PP: 700
SPM1: 100
SPM2: 100

SLTST: tan-crm-offwh,sft-sli frm, sli calc,pred cly sptd grs,vf ind grs, sbang,no ind,grdg to clyst

SURVEY
DEPTH: 673
ANG: 1.5
AZM: 225.6
TVD: 672.9'

MUD
CHECK
MW: 8.9+
VIS: 38

SLTST: aa,tan-crm-offwh,sft-sli frm,sli calc,pred cly sptd grs,vf ind grs,sbang,no ind,grdg to clyst

SURVEY
DEPTH: 703'
ANG: 2.1
AZM: 209.7
TVD: 702.9'

SLTST: gy-mdgy,sft-fri,sli calc, pred cly sptd grs,vf ind grs,sbang, no ind,grdg to clyst

SURVEY
DEPTH: 733'
ANG: 3.4
AZM: 203.3
TVD: 732.8'

SLTST: gy-mdgy,sft-fri,sli calc, pred cly sptd grs,vf ind grs,sbang, no ind,grdg to clyst

SURVEY
DEPTH: 763'
ANG: 5.6
AZM: 193.9
TVD: 762.8'

WOB: 8/10
RPM: 50/60
PP: 700
SPM1: 100
SPM2: 100

SURVEY
DEPTH: 793'
ANG: 8.8
AZM: 185.3
TVD: 792.5'

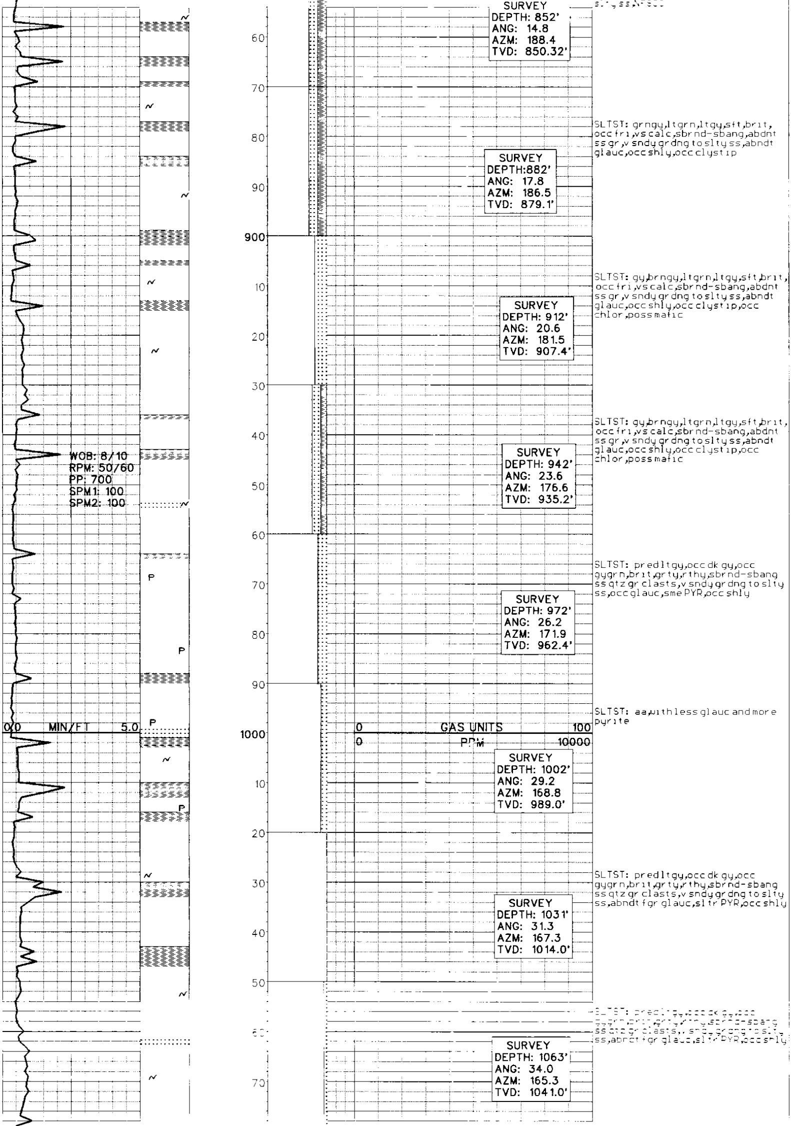
SLTST: aa,m gy-sl gn gy,sft-fri,sli calc,pred cly sptd grs,vf ind grs, sbang,no ind,grdg to clyst

SLTST: grngy,ltgrn,ltgy,sft,brit, occ fri,vs calc,sbrnd-sbang,abdnt ss gr,v sndy grdng to slty ss,abndt glauc,occ shly,occ clyst ip

SURVEY
DEPTH: 823'
ANG: 11.5
AZM: 186.4
TVD: 822.0'

PLUGGED GAS LINE

SS: ltgy,grngy,wh,offwh,crm,tan,vf gr,wsrtd,mtx sptd w/ slty mtx,vp vis intergran por,vs calc,tr chlorite, tr glauc,occ shly,abndt ly grdng to



SURVEY
DEPTH: 852'
ANG: 14.8
AZM: 188.4
TVD: 850.32'

SLTST: grngy,ltgrn,ltgy,sft,brit, occ fri,vs calc,sbrnd-sbang,abdnt ss gr,v sndy grdng to slty ss,abndt glauc,occ shly,occ clystip

SURVEY
DEPTH:882'
ANG: 17.8
AZM: 186.5
TVD: 879.1'

SLTST: gy,brngy,ltgrn,ltgy,sft,brit, occ fri,vs calc,sbrnd-sbang,abdnt ss gr,v sndy grdng to slty ss,abndt glauc,occ shly,occ clystip,occ chlor,poss mafic

SURVEY
DEPTH: 912'
ANG: 20.6
AZM: 181.5
TVD: 907.4'

SLTST: gy,brngy,ltgrn,ltgy,sft,brit, occ fri,vs calc,sbrnd-sbang,abdnt ss gr,v sndy grdng to slty ss,abndt glauc,occ shly,occ clystip,occ chlor,poss mafic

WOB: 8/10
RPM: 50/60
PP: 700
SPM1: 100
SPM2: 100

SURVEY
DEPTH: 942'
ANG: 23.6
AZM: 176.6
TVD: 935.2'

SLTST: predltgy,occ dk gy,occ gygrn,brit,grty,rthy,sbrnd-sbang ssqtz gr clasts,v sndy grdng to slty ss,occ glauc,sme PYR,occ shly

SURVEY
DEPTH: 972'
ANG: 26.2
AZM: 171.9
TVD: 962.4'

SLTST: aa,with less glauc and more pyrite

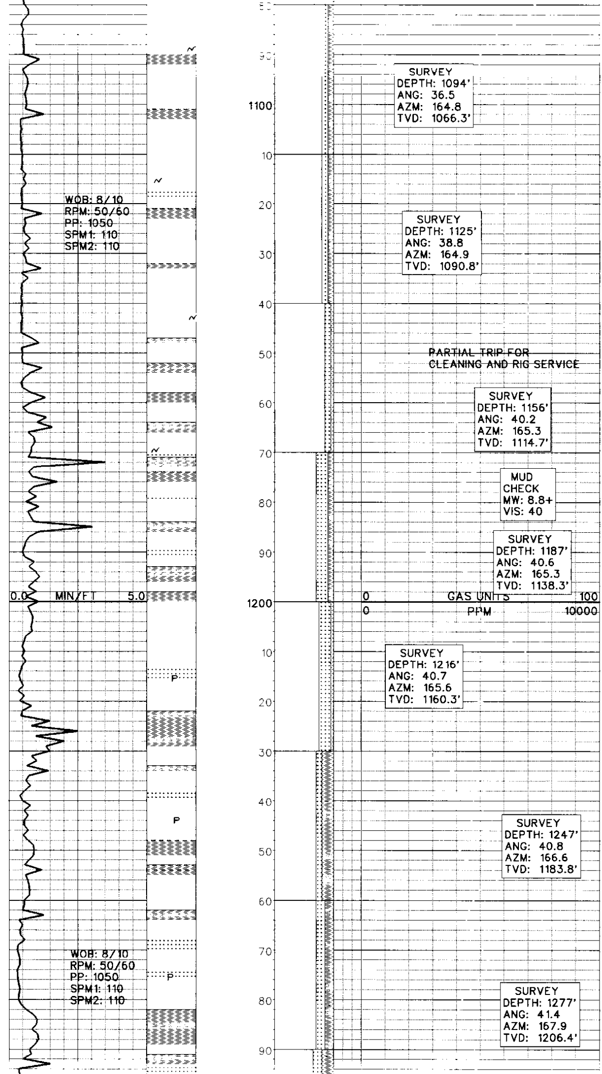
SURVEY
DEPTH: 1002'
ANG: 29.2
AZM: 168.8
TVD: 989.0'

SLTST: predltgy,occ dk gy,occ gygrn,brit,grty,rthy,sbrnd-sbang ssqtz gr clasts,v sndy grdng to slty ss,abndt fgr glauc,sl tr PYR,occ shly

SURVEY
DEPTH: 1031'
ANG: 31.3
AZM: 167.3
TVD: 1014.0'

SLTST: predltgy,occ dk gy,occ gygrn,brit,grty,rthy,sbrnd-sbang ssqtz gr clasts,v sndy grdng to slty ss,abndt fgr glauc,sl tr PYR,occ shly

SURVEY
DEPTH: 1063'
ANG: 34.0
AZM: 165.3
TVD: 1041.0'



SLTST: abndt gygrn,ltgy,ltbrn,tan, occ crm,brit,grty,rthy,sbrnd-sbang ss gr clasts,v sndy grdng to slty ss,abndt fgr glauc,sl tr PYR, occ shly

SURVEY
DEPTH: 1094'
ANG: 36.5
AZM: 164.8
TVD: 1066.3'

SLTST: abndt gygrn,ltgy,ltbrn,tan, occ crm,brit,grty,rthy,sbrnd-sbang ss gr clasts,v sndy grdng to slty ss,abndt fgr glauc,sl tr PYR, occ shly

WOB: 8/10
RPM: 50/60
PP: 1050
SPM1: 110
SPM2: 110

SURVEY
DEPTH: 1125'
ANG: 38.8
AZM: 164.9
TVD: 1090.8'

SLTST: abndt gygrn,ltgy,ltbrn,tan, occ crm,brit,grty,rthy,sbrnd-sbang ss gr clasts,v sndy grdng to slty ss,abndt fgr glauc,sl tr PYR, occ shly

PARTIAL TRIP FOR
CLEANING AND RIG SERVICE

SURVEY
DEPTH: 1156'
ANG: 40.2
AZM: 165.3
TVD: 1114.7'

MUD
CHECK
MW: 8.8+
VIS: 40

SS: ltgy,wh,off wh,s&p,vf gr,w srtd, vs calc,sbrnd gr,mtx sptd w/ vp vis inter gran por,slty mtx grdng to slty ss,occ carb flk incl ip,occ glauc,tr pyr in sample,sltst: aa

SURVEY
DEPTH: 1187'
ANG: 40.6
AZM: 165.3
TVD: 1138.3'

SURVEY
DEPTH: 1216'
ANG: 40.7
AZM: 165.6
TVD: 1160.3'

SLTST: gy-mdgy,ltgy,ltbrn,tan,occ crm,brit,grty,rthy,v sndy grdng to slty ss,mod f-gr glauc,tr pyr,occ shly

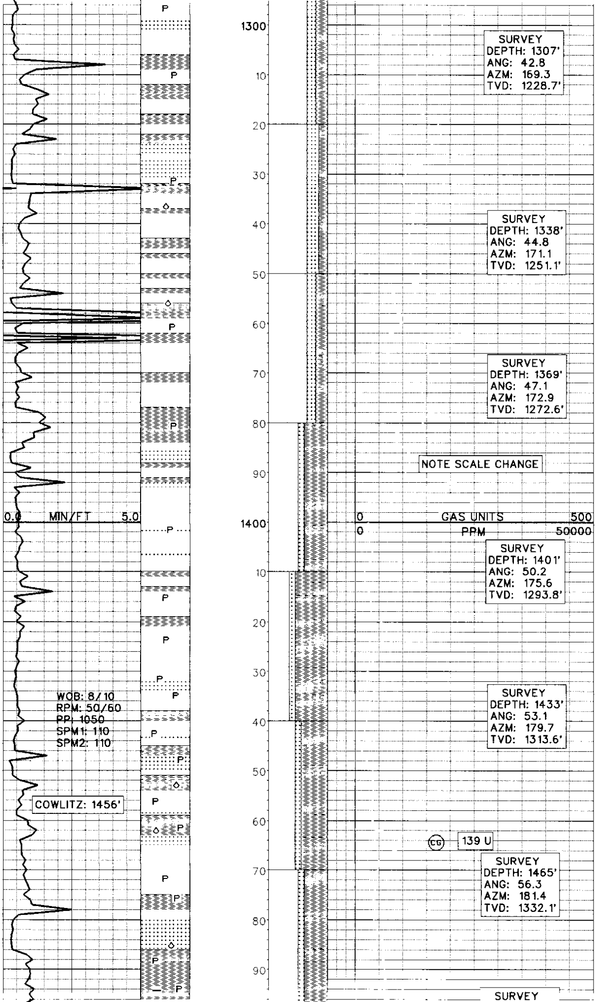
SLTST: gy-mdgy,ltgy,ltbrn,tan,frm-fri,grty,v silty & sndy,sli calc,mod glauc,sli pyr,shly ip

SURVEY
DEPTH: 1247'
ANG: 40.8
AZM: 166.6
TVD: 1183.8'

WOB: 8/10
RPM: 50/60
PP: 1050
SPM1: 110
SPM2: 110

SLTST: gy-mdgy,ltgygn,ltbrn,tan, frm-fri,grty,v silty & sndy,mod glauc,tr pyr

SURVEY
DEPTH: 1277'
ANG: 41.4
AZM: 167.9
TVD: 1206.4'



SLTST: gy-mdgy,ltgygn,ltbrn,tan, frm-fri,grty,sli calc,cont'd v-sndy, n-tr pyr

SURVEY
DEPTH: 1307'
ANG: 42.8
AZM: 169.3
TVD: 1228.7'

SLTST: gy-mdgy,ltgygn,ltbrn-tan, frm-fri,grty,cont'd v-sndy,tr pyr, tr carb mats,tr brac

SURVEY
DEPTH: 1338'
ANG: 44.8
AZM: 171.1
TVD: 1251.1'

SLTST: gy-mdgy,ltgygn,ltbrn-tan, frm-fri,grty,n-sli calc,cont'd v-sndy,tr pyr,tr brac

SURVEY
DEPTH: 1369'
ANG: 47.1
AZM: 172.9
TVD: 1272.6'

NOTE SCALE CHANGE

SLTST: aa,w/ few carb mats; CLYST: tan-buff,vltbrn,sft,slty & sndy ip, grdg to vf mudst

SURVEY
DEPTH: 1401'
ANG: 50.2
AZM: 175.6
TVD: 1293.8'

CLYST: gy-mdgy,occ dkgy,w/ tan-vltbrn,sft,slty & sndy ip,grdg to vf mudst

WOB: 8/10
RPM: 50/60
PP: 1050
SPM1: 110
SPM2: 110

SURVEY
DEPTH: 1433'
ANG: 53.1
AZM: 179.7
TVD: 1313.6'

SLTYCLYST: gy-mdgy,tan-mdgybrn, vsft-fri,tr carb mats,gen slty,sli sndy ip,sli calc,few gn chlor grns, tr brac,mod pyr

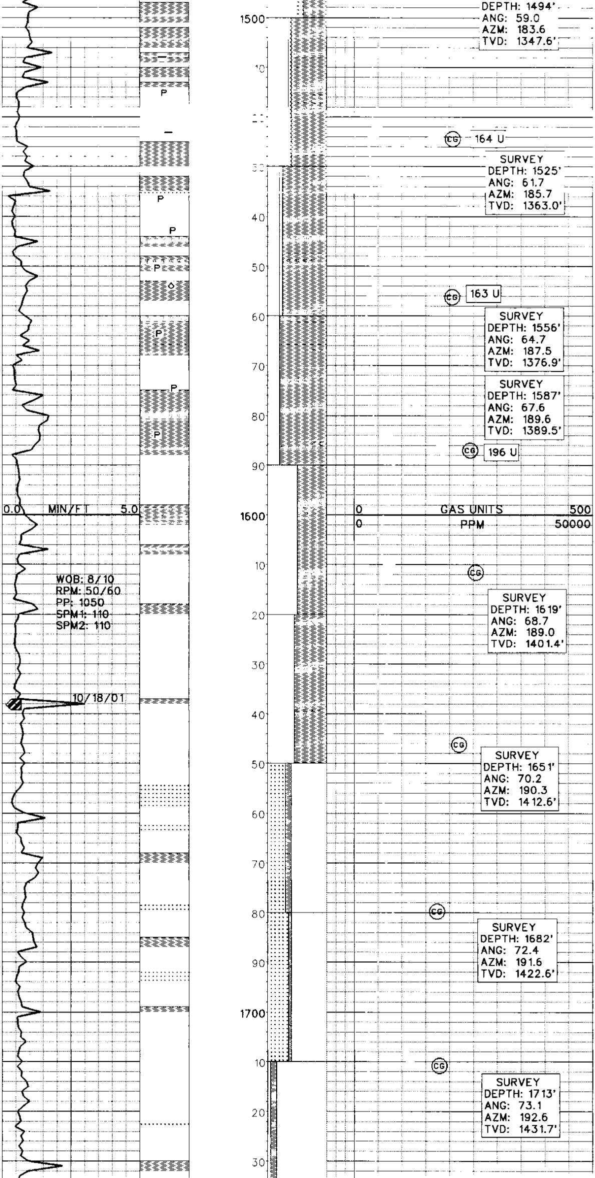
COWLITZ: 1456'

139 U

SURVEY
DEPTH: 1465'
ANG: 56.3
AZM: 181.4
TVD: 1332.1'

CLYST: md-dkgy,md-dkgybrn,vsft-fri,tr carb mats,gen slty,sli sndy ip, mod gnchlor grns,tr brac,mod pyr

SURVEY



CLYST: md-dkgy,sli gygn tnt,md-dkgybrn,vsft-fri,abnt clycmtd grns,tr carb mats,gen slty,sli sndy ip,abnt gn chlor grns,mod pyr,shly lams

CLYST: md-dkgy,gybrn,occ brn slty grns,sft-fri,occ brit,sm-uxy txt in dk grns,tr carb mats & flks,abnt chlor grns,mod-abnt pyr,sli calc

CLYST: md-dkgy,gybrn,occ-mod brn sltygrns,sft-brit,rthy-sm txt in dk grns,tr carb mats & flks,abnt chlor grns,mod-abnt pyr,sli calc

CLYST: gy,dk gy,occ lty gy,brn,sft,grty,rthy,occ brit,v sl calc,v slty,sndy,occ ss gr clast incl,mudstone abndt ip,pred washed out

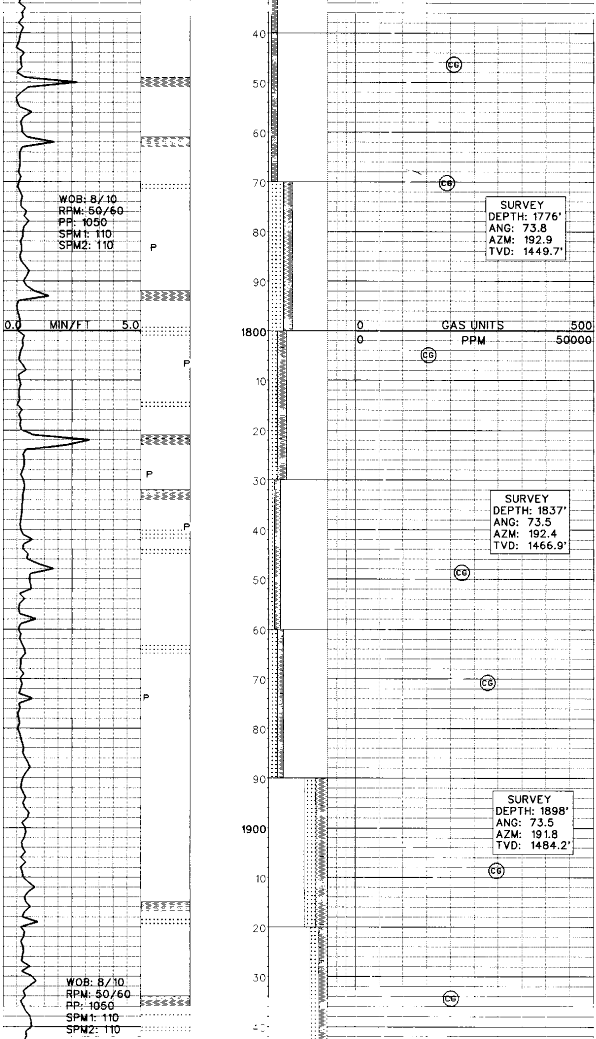
CLYST: gy,dk gy,occ lty gy,brn,sft,grty,rthy,occ brit,v sl calc,v slty,sndy,occ ss gr clast incl,mudstone abndt ip,pred washed out

****SLTST GRADING TO SHALE****

SS: lt-dk brn,orngbrn,rdbrwn,occ off wh,vf gr,wsrtd,sbrnd-sbang,pred mtx sptd w/ abndt gr sptd thru,mod vis intergran por,mod calc cmtd,abndt carb flk incl,slty mtx,NFSOC

SLTY SH: grn gy,ltgy,blugy,occ dk gy,brit,rthy,grty,sbplty-sbblky,mod calc,v slty,occ sndy

SLTY SH: grn gy,ltgy,blugy,occ dk gy,brit,rthy,grty,sbplty-sbblky,mod calc,v slty,occ sndy



WOB: 8/10
RPM: 50/60
PP: 1050
SPM1: 110
SPM2: 110

SURVEY
DEPTH: 1776'
ANG: 73.8
AZM: 192.9
TVD: 1449.7'

SURVEY
DEPTH: 1837'
ANG: 73.5
AZM: 192.4
TVD: 1466.9'

SURVEY
DEPTH: 1898'
ANG: 73.5
AZM: 191.8
TVD: 1484.2'

WOB: 8/10
RPM: 50/60
PP: 1050
SPM1: 110
SPM2: 110

SLTY SH: grn gy,ltgy,blugy,occ dk gy, brit,rthy,grty,sbplty-sbblky,mod calc,v slty,occ sndy

SS: lt-dk brn,orngbrn,rdbrun,occ off wh,vf gr,w srtd,sbrnd-sbang, pred mtx sptd w/ abndt gr sptd thru, pred lse uncons gr,occ clust,mod vis intergran por,mod calc cmtd, abndt carb flk incl,slty mtx,NFSOC

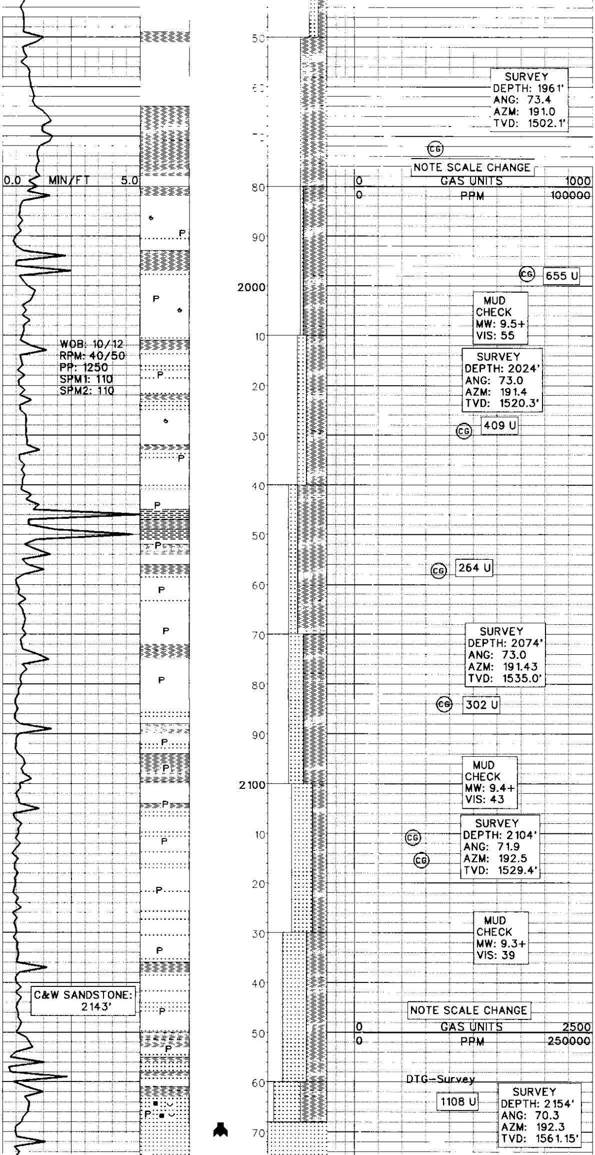
SLTY SH: grn gy,ltgy,blugy,occ dk gy, brit,rthy,grty,sbplty-sbblky,mod calc,v slty,occ sndy,occ PYR thru

SLTY SH: grn gy,ltgy,blugy,occ dk gy, brit,rthy,grty,sbplty-sbblky,mod calc,v slty,occ sndy,occ PYR thru

SLTY SH: grn gy,ltgy,blugy,occ dk gy, brit,rthy,grty,sbplty-sbblky,mod calc,v slty,occ sndy,occ PYR incl and lse thru

SLTST: ltbrn,ltgy,occ dk gy,rdbrn, orngbrn,v sft,mlky,occ brit,rthy, grty,blky,vr shly,v sandy,v calc

SLTST: ltbrn,ltgy,occ dk gy,rdbrn, orngbrn,v sft,mlky,occ brit,rthy, grty,blky,vr shly,v sandy,v calc



CLYST: ltbrn,brn,occ gy,vsft,grty, rthy,pred [illegible],most washes out of sample,[illegible]

SLTST: gy-mdgy,vsft-fri,grty-rthy, sli calc cmt,few calc xls,carb mats, tr chlor,few ceph shells,mod pyr

DEPTH: 2,000'
METHANE: 7905 ppm
ETHANE: 0 ppm
PROPANE: 0 ppm
BUTANE: 0 ppm

SLTST: gy-mdgy,vsft-fri,grty-rthy, sli calc cmt,few-mod calc xls,carb mats,tr chlor,tr ceph shells,mod pyr

CLYST: md-dkgy,occ gybrn,sft-frm, rthy-sm,vsli calc,slty & sndy ip, grdg to slty mudst ip

SLTST: gy-mdgy,occ tan-ltbrn,vsft-fri,grty-rthy,sli calc cmt,few-mod calc xls,carb mats,tr-mod chlor,mod pyr

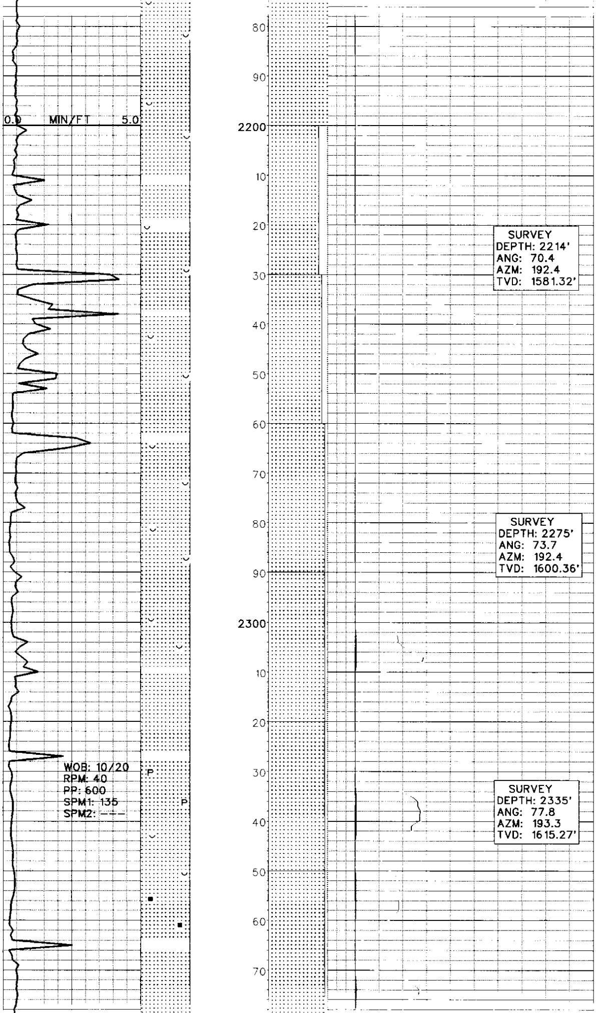
DEPTH: 2,100'
METHANE: 6247 ppm
ETHANE: 0 ppm
PROPANE: 0 ppm
BUTANE: 0 ppm

SLTST: gy-mdgy,few tan-crm-buff grns,vsft-fri,grty-rthy,sli calc cmt,few calc xls,mod carb flks,mod chlor,mod pyr,tr musc

SLTYCLYST: gy-mdgy,vsft-fri,grty-rthy,occ rthy-sm,sli calc,few-mod calc xls,carb flks thru,tr chlor,mod pyr,abnt musc thru

45 MICRON SEIVE: SS: clr-trnsl-trnsp-fr stdlse qtz grns,vf-f gr,vw-srtd,ang-sbang,cly mtx spt,no vis cmt,sli ark,abnt musc thru,tr-mod chlor grns,

TOOH, SET CASING, E-LOG
DRILL AHEAD 10/25/01



SS: clr,trnsp,trnsl,wh,offwh,vf gr, vw srtd,sbrnd gr,gr sptd,n calc,vg vis inter gran por,abndt mica,NFSOC

DEPTH: 2,200'
METHANE: 1816 ppm
ETHANE: 0 ppm
PROPANE: 0 ppm
BUTANE: 0 ppm

SS: clr,trnsp,trnsl,wh,offwh,m-f gr, vw srtd,sbrnd gr,n calc,gr sptd,vg vis inter gran por,sample is pred musc and biotite,occ shly sltst chips ip,NFSOC

SURVEY
DEPTH: 2214'
ANG: 70.4
AZM: 192.4
TVD: 1581.32'

SS: clr,trnsp,trnsl,wh,offwh,chlky, mlky,sbrnd-sbang,m-f gr,vw srtd,gr sptd w/ occ vis cmtd clust,vg vis inter gran por,n calc,abndt mica-less than above

SS: clr,trnsp,trnsl,wh,offwh,chlky, mlky,sbrnd-sbang,m-f gr,vw srtd,gr sptd w/ occ vis cmtd clust,vg vis inter gran por,n calc,abndt mica,occ carb flk,occ pyr

SURVEY
DEPTH: 2275'
ANG: 73.7
AZM: 192.4
TVD: 1600.36'

DEPTH: 2,300'
METHANE: 37561 ppm
ETHANE: 0 ppm
PROPANE: 35 ppm
BUTANE: 0 ppm

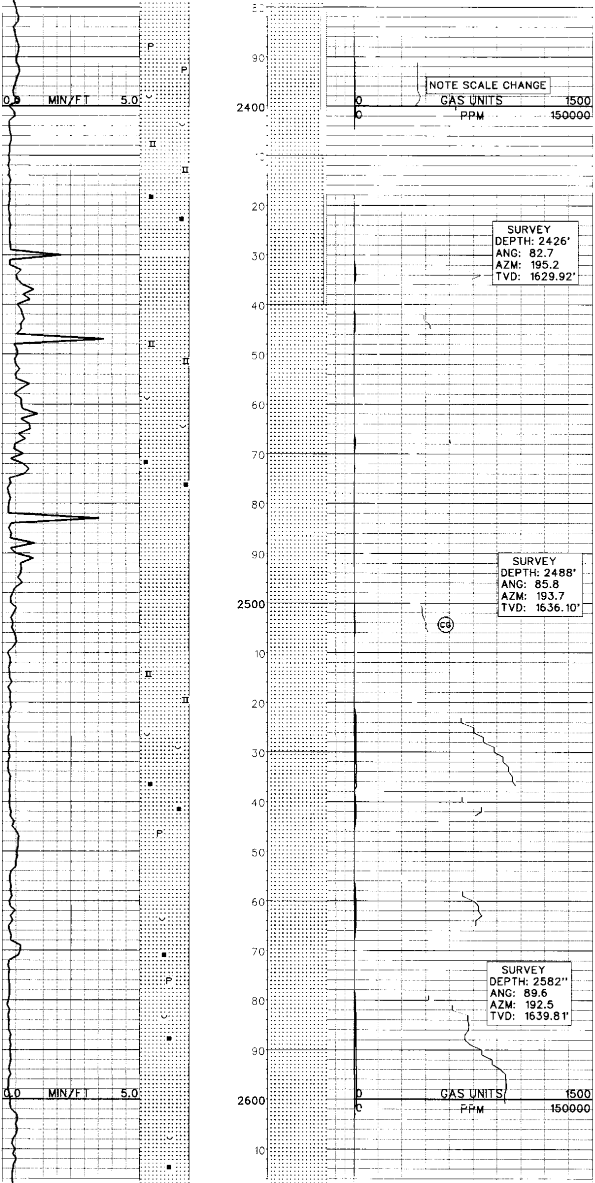
SS: clr,trnsp,trnsl,wh,offwh,chlky, mlky,sbang,m gr,vw srtd,gr sptd w/ occ cmtd clust,vg vis inter gran por, n calc,abndt mica,occ carb flk,occ pyr

WOB: 10/20
RPM: 40
PP: 600
SPM1: 135
SPM2: ---

SS: clr,trnsp,trnsl,wh,offwh,chlky, mlky,sbang,m gr,vw srtd,gr sptd,vg vis inter gran por,n calc,abndt mica, occ carb flk,occ pyr

SURVEY
DEPTH: 2335'
ANG: 77.8
AZM: 193.3
TVD: 1615.27'

SS: clr,trnsp,trnsl,wh,offwh,chlky, mlky,sbang,m gr,vw srtd,gr sptd w/ occ clust,vg vis inter gran por,n calc,abndt mica,occ carb flk,occ pyr



SS: clr,trnsp,trnsl,wh,offwh,chlky,
mlky,sbang,m gr,vw srtd,gr sptd w/
occ vis clust,vg vis inter gr an por,n
calc,abndt mica,occ carb flk,

DEPTH: 2,400'
METHANE: 64092 ppm
ETHANE: 805 ppm
PROPANE: 72 ppm
BUTANE: 0 ppm

SS: clr,trnsp,trnsl,wh,offwh,chlky,
mlky,sbang,m-f gr,vw srtd,gr sptd w/
occ vis clust,vg vis inter gr an por,v
calc,LS stringers,abndt mica,occ
carb flk,sme pyr

SURVEY
DEPTH: 2426'
ANG: 82.7
AZM: 195.2
TVD: 1629.92'

SS: clr,trnsp,trnsl,wh,offwh,chlky,
mlky,sbang,m-f gr,vw srtd,gr sptd w/
occ vis clust,vg vis inter gr an por,v
calc,LS stringers,abndt mica,occ
carb flk,sme pyr

SS: clr,trnsp,trnsl,wh,off wh,mlky,
crm,sbang gr,m gr,gr sptd,calc cmtd,
vg vis inter gr an por,abndt mica,
abndt carb flk,occ PYR

SURVEY
DEPTH: 2488'
ANG: 85.8
AZM: 193.7
TVD: 1636.10'

DEPTH: 2,500'
METHANE: 41477 ppm
ETHANE: 0 ppm
PROPANE: 53 ppm
BUTANE: 0 ppm

SS: clr,trnsp,trnsl,wh,off wh,mlky,
crm,sbang gr,m gr,gr sptd,v calc
cmtd,vg vis inter gr an por,abndt
mica,occ carb flk,occ PYR

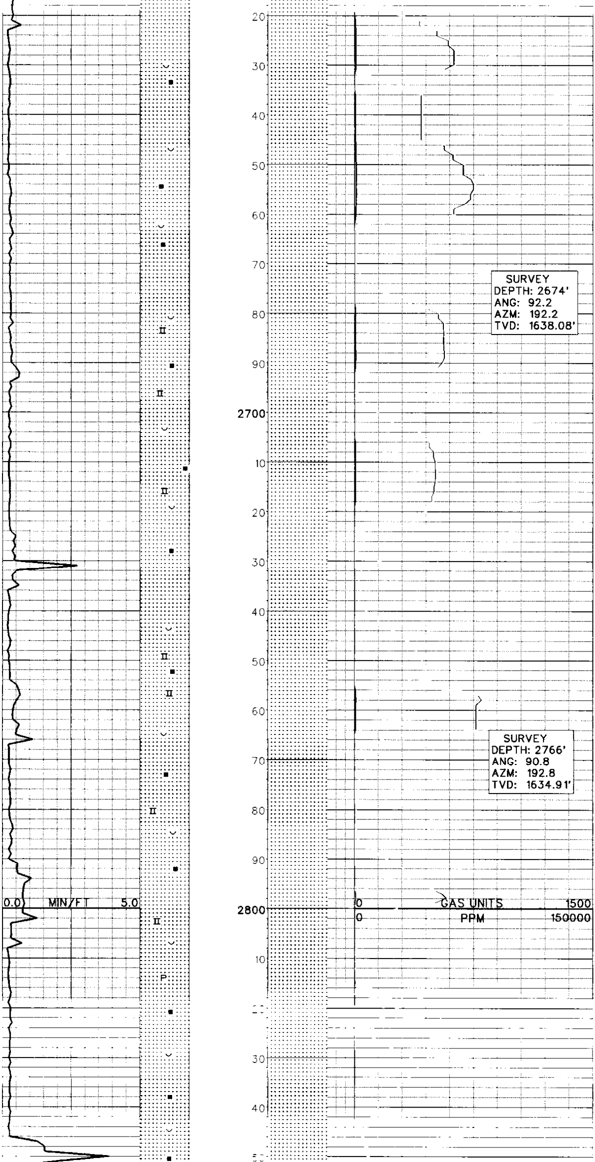
SS: clr,trnsl,trnsp,mlky wh,sbang,
up m-l crs gr,gr sptd,mod calc,pr
cmtd,g intr gan por,mod-abnt mica,
mod carb flks,tr pyr

SS: clr,trnsl,trnsp,mlky wh,sbang,
up m-l crs gr,gr spt,mod calc,pr cmtd,
g intr gr an por,abnt mica,abnt carb
flk,tr pyr

SURVEY
DEPTH: 2582''
ANG: 89.6
AZM: 192.5
TVD: 1639.81'

DEPTH: 2,600'
METHANE: 94961 ppm
ETHANE: 1380 ppm
PROPANE: 149 ppm
BUTANE: 0 ppm

SS: clr,trnsl,trnsp,mlky wh,sbang,
up m-l crs gr,gr spt,mod calc,sli
calc cmt,g intr gr an por,abnt mica,
abnt carb flk



SS: clr,trnsl,trnsp,frstd,mlkywh, sbang,upm-l crs gr,gr spt,mod calc, sli calc cmt,g intr gran por,abnt mica,abnt carb flk

SS: clr,trnsl,trnsp,vltgy,mlkywh, sbang,lm-l crs gr,gr spt,sli calc,pr cmtd,g intr gran por,abnt mica,mod carb flk

SURVEY
DEPTH: 2674'
ANG: 92.2
AZM: 192.2
TVD: 1638.08'

SS: pred trnsl-trnsp w/feu clr grs, vltgy,mlkywh,sbang,lm-l crs gr,gr spt,sli-mod calc,pr cmtd,g intr gran por,mod mica,mod carb flk,mod ls strg

DEPTH: 2,700'
METHANE: 14350 ppm
ETHANE: 0 ppm
PROPANE: 0 ppm
BUTANE: 0 ppm

SS: trnsl,trnsp,occ clr & vltgy,mlky wh,sbang,lm-l crs gr,gr spt,sli-mod calc,pr cmtd,g intr gran por,sli mica, sli carb flk,mod ls strg

SS: trnsl,trnsp,occ clr & vltgy,mlky wh,sbang,upm-l crs gr,gr spt,sli-mod calc,pr cmtd,g intr gran por,mod mica,sli carb flk,mod ls strg

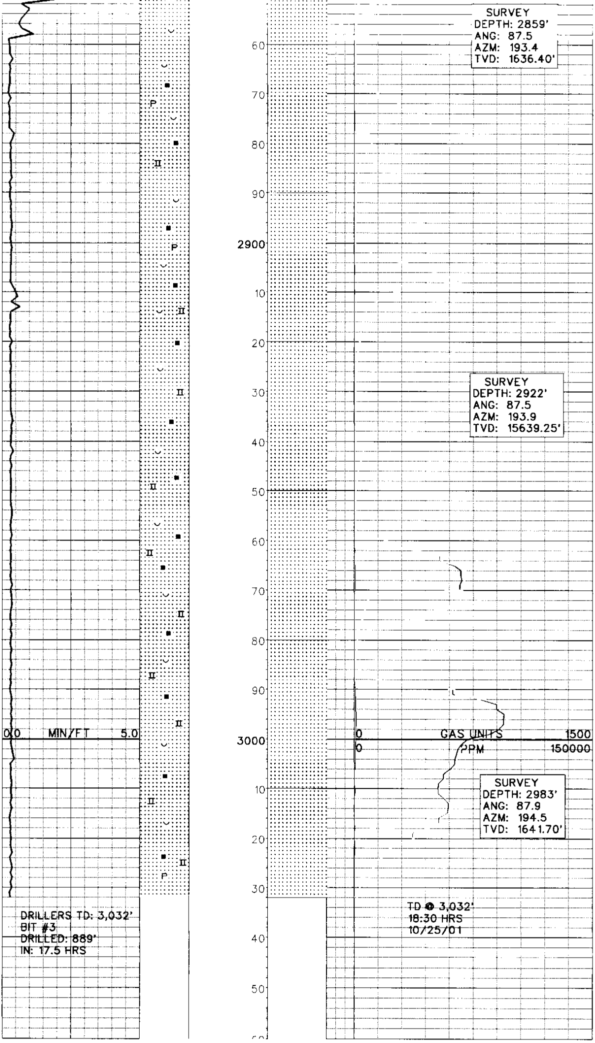
SURVEY
DEPTH: 2766'
ANG: 90.8
AZM: 192.8
TVD: 1634.91'

SS: clr,trnsl,trnsp,vltgy,mlkywh, sbang,upm-l crs gr,gr spt,sli-mod calc,pr cmtd,g intr gran por,mod mica,sli carb flk,mod ls strg

DEPTH: 2,800'
METHANE: 27465 ppm
ETHANE: 0 ppm
PROPANE: 107 ppm
BUTANE: 0 ppm

SS: pred clr,trnsl,trnsp,w/occ vltgy,mlkywh,sbang-sbrnd,lm-l crs gr,gr spt,mod-v calc,pr cmtd,g intr gran por,mod mica,sli carb flk, feu ls strg,tr pyr

SS: pred clr,trnsl,trnsp,w/occ vltgy,mlkywh,sbang-sbrnd,lm-l crs gr,gr spt,sli calc,pr cmtd,g intr gran por,sli-mod mica,sli carb flk,sli-mod ls strg



SURVEY
DEPTH: 2859'
ANG: 87.5
AZM: 193.4
TVD: 1636.40'

SS: pred trnsl,trnsp,frstd,w/ mod vltgy,sbang-sbrnd,upm-l crs gr,gr spt,sli calc,pr cmtd,g intr gran por, sli-mod mica,abnt carb flk,sli-mod ls strg,tr pyr

DEPTH: 2,900'
METHANE: 493 ppm
ETHANE: 0 ppm
PROPANE: 0 ppm
BUTANE: 0 ppm

SS: pred trnsl,trnsp,frstd,w/ few wh-vltgy grs,sbang,upm-l crs gr,gr spt, mod-v calc,pr cmtd,g intr gran por, sli-mod mica,abnt carb flk,sli-mod ls strg,tr pyr

SURVEY
DEPTH: 2922'
ANG: 87.5
AZM: 193.9
TVD: 15639.25'

SS: pred clr,trnsl,trnsp,frstd,w/ v few wh-vltgy grs,sbang,upm-l crs gr,gr spt,sli-mod calc,pr cmtd,g intr gran por,sli mica,abnt carb flk, mod ls strg,tr pyr

SS: pred clr,trnsl,trnsp,frstd,w/ v few wh-vltgy grs,sbang,upm-l crs gr,gr spt,sli-mod calc,pred lse,g intr gran por,mod mica,mod-abnt carb flk,mod ls strg

SS: pred opq,trnsl,trnsp,frstd,w/ few wh & vltgy grs,sbang-sbrnd,upm-l crs gr,gr spt,sli-mod calc,pr cmtd, g intr gran por,sli mica,abnt carb flk,mod-abnt ls strg

DEPTH: 3,000'
METHANE: 71519 ppm
ETHANE: 857 ppm
PROPANE: 665 ppm
BUTANE: 508 ppm

SURVEY
DEPTH: 2983'
ANG: 87.9
AZM: 194.5
TVD: 1641.70'

SS: pred clr,trnsl,trnsp,frstd,w/ v few wh-vltgy grs,sbang,upm-l crs gr,gr spt,sli-mod calc,pr cmtd,g intr gran por,sli mica,abnt carb flk, mod ls strg,tr pyr

DEPTH: 3,032'
METHANE: 1647 ppm
ETHANE: 0 ppm
PROPANE: 0 ppm
BUTANE: 0 ppm

DRILLERS TD: 3,032'
BIT #3
DRILLED: 889'
IN: 17.5 HRS

TD ● 3,032'
18:30 HRS
10/25/01