GARY F. GENSCH
PETROLEUM GEOLOGIST

GEOLOGIC REPORT LOG

COMPANY:	**GATEWAY RESOURCES, LLC**	
WELL NAME:	**#1-8 BOWLING**	
FIELD/API #:	**WILDCAT**	**API: 15-025-21,571-0000**
LOCATION:	**SECTION 8-30S-23W**	
	1900' FNL & 1631' FWL	
COUNTY:	**CLARK COUNTY, KANSAS**	

ELEVATIONS
All Measurements Are From: K.B.

K.B	2,539
D.F.	2,537
G.L	2,529
R.T.D.	6,589

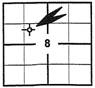
DRLG. CONTRACTOR: VAL ENERGY: RIG NO. 2
SPUD: 2/09/2014 — **COMP:** 2/27/2014
RTD: 6,589' — **LTD:** 6,592'
MUD UP AT: 3,791' — **MUD TYPE:** CHEM GEL (Mud-Co)

CASING
SURFACE:
8-5/8" @ 534'
PRODUCTION:
D & A

DRILLING TIME KEPT FROM: 1,450'-1,560' / 3,900' TO RTD
SAMPLES EXAMINED FROM: 4,150' TO RTD
SAMPLES SAVED FROM: 4,000' TO RTD
GEOLOGICAL SUPERVISION FROM : 4,370' TO RTD

LOGS RUN
DIL, CDN w/PE LOGS

Nabors Comp. & Prod.



8-30S-23W

DRILL STEM TESTS
5
Trilobite Testing

GAS TESTING
Earth Tech OGL, Inc,

FORMATION TOPS	SAMPLE	E-LOG	L. DATUM	REF. WELL 1	DIFF.
TOPEKA	3,962	3,962	-1,423	-1417	-6
HEEBNER	4,417	4,417	-1,878	-1877	-1
BROWN LIME	4,572	4,572	-2,033	-2,032	-1
LANSING	4,588	4,588	-2,049	-2,057	8
BKC	5,057	5,076	-2,537	-2,529	-8
MARMATON	5,077	5,076	-2,537	-2,546	9
PAWNEE	5,155	5,155	-2,616	-2,632	16
CHEROKEE SHALE	5,200	5,200	-2,661	-2,680	19
MORROW SHALE	5,304	5,304	-2,765	-2,790	25
MISS. ST. GEN	5,340	5,340	-2,801	-2,818	17
MISS. ST. LOUIS	5,350	5,350	-2,811	-2,890	79
MISS. SPERGEN	5,480	5,480	-2,941	-3,042	101

REF. WELL #1: Palomino Petroleum, Inc. #1 Taylor, Sec. 20-30S-23W: 2540' FSL, 390' FWL, KB: 2,454.
REF. WELL: ~1-1/2 miles south from well.

GATEWAY RESOURCES, LLC 224 S. CRESTWAY WICHITA, KS 67218 316-684-0199

DEVIATION SURVEY

DEPTH	DEGREE
541'	1 1/2
4,977'	1
6,005'	1
6,589'	1 1/2

DAILY PENETRATION

DATE 2014	DEPTH 7:00 AM	COMMENTS
2/8	MIRU	
2/9	SPUDDED WELL	AT 10:00 PM
2/10	254'	Set Surf at 534': 2:30 PM
2/11	935'	DRLG AHEAD
2/12	2,482'	DRLG AHEAD
2/13	3,175'	DRLG AHEAD
2/14	3,895'	DRLG AHEAD
2/15	4,508'	DRLG AHEAD
2/16	4,975	DRLG AHEAD
2/17	5,034'	DRLG AHEAD

DAILY PENETRATION

DATE 2014	DEPTH 7:00 AM	COMMENTS
2/18	5,179'	PULLING DST # 2
2/19	5,336	RUNNING DST #3
2/20	5,338'	SHUT DOWN-WEATHER
2/21	5,600'	DRLG AHEAD
2/22	5,970'	DRLG AHEAD
2/23	6,110'	DRLG AHEAD
2/24	6,380'	DRLG AHEAD
2/25	6,589'	SHORT TRIP FOR LOG
2/26	6,589'	LAYING DOWN PIPE
2/27	6,589'	MOVING OFF LOCATION

GENERAL INFORMATION

BIT RECORD

NUMBER	SIZE	TYPE	SERIAL #	DEPTH S RAN	HOURS
1 - RR	12 1/4	PDC	NA	SURFACE - 541'	3.00
2 - NEW	7 7/8	HA20Q	1323188	541' - 5336'	123 1/2
3 - NEW	7 7/8	HA30Q	E18819	5336' - 6589'	83 1/2

STRAP at 4,977':

STRAP	4,975.04'
BOARDS	4,977.46'
SHORT	2.32'

CASING & CEMENT RECORD:

SURF CASING SET AT 534': Francis casing crews ran 13 joints new, 23#, 8-5/8" casing; tally: 522 ft. Welded each joint w/straps. Ran baffle on shoe joint and one basket. Set at 534' Allied ran 155 sx:65/35 poz mix w/6% gel, 3% cc, ¼# floseal. Tail 125 sx Class A cmt, 3% cc. Cement did circulate to surface. 2:30 PM Plug down. WOC 4 hrs, rigged up nipple/BOP another 4 hours: Total WOC: 8 hrs.

FORMATION TOPS (CONT)	SAMPLE	E-LOG	L. DATUM	REF. WELL 2	DIFF.
MISS. WARSAW	5,350	5,350	-2,811	-3,207	396
MISS. OSAGE	5,976	5,976	-3,437	-3518	81
KINDERHOOK	6,266	6,266	-3,727	-3804	77
VIOLA	6,384	6,384	-3,845	-3928	83
SIMPSON DOLOMITE	6,484	6,484	-3,945	-4028	83
SIMPSON SHALE	6,520	6,520	-3,981	-4048	67
REW. ARBUCKLE	6,554	6,554	-4,015	-4104	89
RTD / LTD	6,589	6,592	-4,053	-4218	165

REF. WELL #2: Big X Drilling Co. #1 Lot Taylor, Sec. 21-30S-23W: SW SW NE, KB: 2,392. ~1-1/2 miles SE of well.

REMARKS & RECOMMENDATIONS

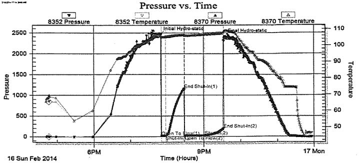
Although the structures came in as predicted according to the 3-D seismic, based on the reservoir analysis of the St. Louis zone tested in DST#4, the other negative drill stem test recoveries and log calculations seeing no commercial reservoir development, the decision was made to plug and abandon the well.

Respectfully submitted,
Gary F Gensch
Gary F. Gensch, Petroleum Geologist
3/7/2014

DRILL STEM TESTS

DST INTERVAL/FM.	FP TIME	IFP/FFP	SIP TIME	ISIP/FSIP	RECOVERY
DST #1: 4937'-4977' LKC K	IFP: 5": 18 - 20# FFP: 30": 20 - 24#		ISIP: 30": 1156# FSIP: 30": 197#		12' TOTAL FLUID

ELECTRICAL CHART TEMP: 108 DEG. F.



12' Drilling Mud (No Oil Show)

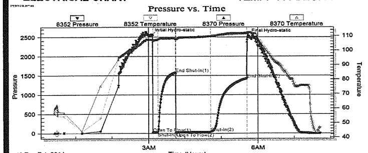
COMMENTS:

IF: Weak blow, 1/4"
ISI: No return blow,
FF: Very weak intermittent surface blow
FSI: No return blow
HP: 2469-2414#

VIS 50, WT 9.3 WL 9.6, LCM 2#, CHL 8900 PPM

DST INTERVAL/FM	FP TIME	IFP/FFP	SIP TIME	ISIP/FSIP	RECOVERY
DST #2: 5146' - 5179' PAWNEE	IFP: 5": 19 - 21# FFP: 60": 22 - 33#		ISIP: 30": 1573# FSIP: 60": 1426#		90' GAS IN PIPE 35' TOTAL FLUID (0.49 Bbls)

ELECTRICAL CHART TEMP: 111 DEG. F.



35' Sli-Oil Cut Mud (<1% OIL)

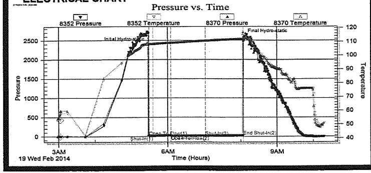
COMMENTS:

IF: Weak blow from 1/4" to 3/4"
ISI: No return blow
FF: Weak blow building form 1/4" to 1" that was sustained throughout , FSI: No return blow
HP: 2554-2533#

VIS 51, WT 9.4, WL 11.2, LCM 2#, CHL 9800 PPM

DST INTERVAL/FM	FP TIME	IFP/FFP	SIP TIME	ISIP/FSIP	RECOVERY
DST #3: 5298' - 5336' MORROW SAND	IFP: 5": 14 - 12# FFP: 60": 13 - 16#		ISIP: 30": 31# FSIP: 60": 39#		125' GAS IN PIPE 15' TOTAL FLUID

ELECTRICAL CHART TEMP: 112 DEG. F.



15' Drilling Mud (No Oil Show)

COMMENTS:

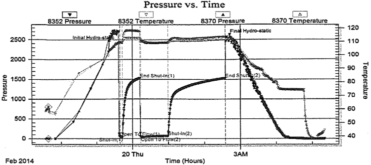
IF:Fair blow from 3" to 7"
ISI: Weak blow to 1/4"
FF: Weak blow bldg 1/2 to 2-1/4" throughout,
FSI: No return blow
HP: 2684-2602#

VIS 48,WT 9.4,WL 9.6, LCM 3#, CHL 10,000 PPM

DRILL STEM TESTS

DST INTERVAL/FM.	FP TIME	IFP/FFP	SIP TIME	ISIP/FSIP	RECOVERY
DST #4: 5346' - 5382' MISS. ST. LOUIS	IFP: 5": 46 - 37# FFP: 45": 39 - 65#		ISIP: 30": 1528# FSIP: 90": 1528#		GTS in 4 Minutes 80' TOTAL FLUID

ELECTRICAL CHART TEMP: 112 DEG. F.



80' Gassy Oil Cut Mud
(33%G, 30%O, 37%M)

COMMENTS: TOT OIL: 3.23 BOPH

IF: Strong blow off B.O.B. in 10 secs
ISI: GTS in 4 mins. Weak blow back 1/4"
FF: Strong blow (See Flow Chart Below) ,
FSI: Weak blow 1/2 - 2"
HP: 2709-2570#

VIS 55,WT 9.3,WL 9.6,LCM3#,CHL 10,00 PPM

DST INTERVAL/FM	FP TIME	IFP/FFP	SIP TIME	ISIP/FSIP	RECOVERY
DST #4: 5346' - 5382' MISS. ST. LOUIS	IFP: 5": 46 - 37# FFP: 45": 39 - 65#		ISIP: 30": 1528# FSIP: 90": 1528#		

DST #4 FINAL GAS FLOW CHART

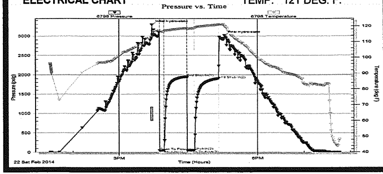
DST #4: Final Flow Chart

Min	PSIG	Orif	Field MCFG	Atmos
10	11	1/4"	38	40
20	13	1/4"	41	43
30	13	1/4"	41	43
40	14	1/4"	42	45
45	14	1/4"	42	45

Gas burned rich yellow-blue flame

DST INTERVAL/FM	FP TIME	IFP/FFP	SIP TIME	ISIP/FSIP	RECOVERY
DST #5: 5945 - 6005' MISS. OSAGE	IFP: 5": 44- 48# FFP: 10": 49 - 55#		ISIP: 30": 1952# FSIP: 30": 1903#		20' TOT. FLUID

ELECTRICAL CHART TEMP: 121 DEG. F.



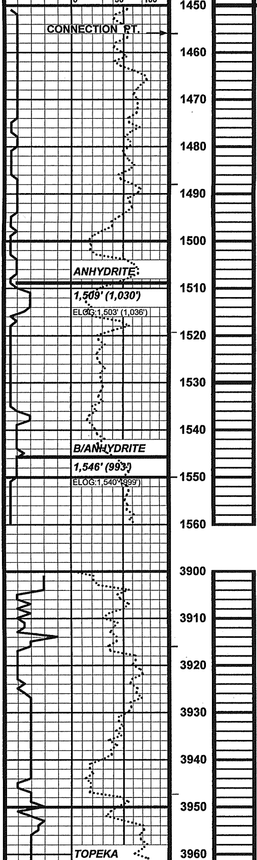
20' Drilling Mud (100% M)

COMMENTS: 37.17 BOPH

IF: Weak 1/2" blow .
ISI: No return blow
FF: No blow
FSI: No return blow
HP: 3287-3010

VIS 52,WT 9.5,WL 11.0, LCM 3#,CHL 8500 PPM

DRILLING TIME IN MIN.'S/FT. Rate of Penetration Decreases 5" 10" 15" GAMMA RAYS 0 50 100	DEPTH	LITH.	DSTS, OIL SHWS, CFS PTS	LAG TIME	SAMPLE DESCRIPTIONS ALL OIL & GAS SHOWS UNDERLINED	REMARKS



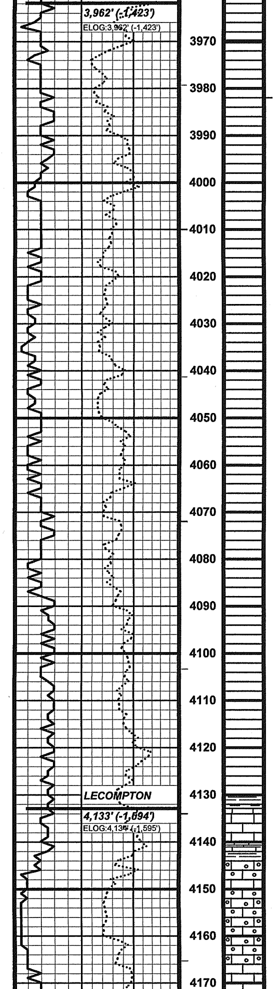
NOTE: WHERE NECESSARY, ALL ORIGINALLY PICKED DRILLING TIME FM. TOPS HAVE BEEN ADJUSTED TO FIT THE COMPENSATED DENSITY-NEUTRON LOG FOR FUTURE REFERENCE.

DISPLACING MUD SYSTEM @ 3791'

MUD CIRC. @ 3822'

At 3853': VIS 52, WT 8.6

At 3895': VIS 47, WT 8.7



MUD-CO at 3985': VIS 50, WT 8.75, WL 8.8,
LCM 0#, CHL 4,200 PPM

At 4103': VIS 46, WT 8.8

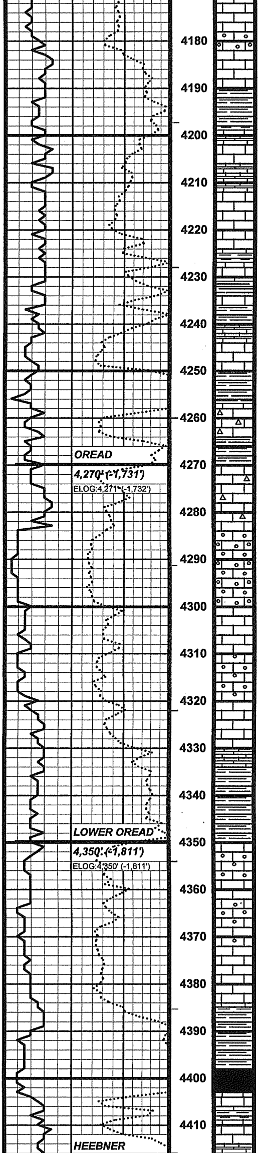
SAMPLE QUALITY FAIR TO GOOD WITH DEPTH

Clystns, md-dk gy, grn gy, tr rd. **LECOMPTON:** Ls, md-dk gy, tn-brn,
5 fn-xln, carb, no vis por, no stn, no fluor, w/tr's Sh, blk, carb, sli-fissle
6 W/ Depth inc Ls, tn-brn, fn-xln , no vis por, no stn, no fluor, no odr,
7 NS.

Ls, lt tn-tn, md-xln, v. grainy-sli granulr surf textr, p-fr intr-xln por, w/ much fr-gd ppt por, brittle-porous, no stn, v. dull min fluor, no odr, NS. Sm pcs: Ls, tn, micro-oom, scat p-fr oom por, no stn, dull in fluor to Ls, micro-ool, v. p intr-xln por, no stn, no fluor, no show.

8

Tr's Ls, lt tn-tn, md-xln, v. grainy-sli granulr surf textr, aa & Ls, tn, micro-oom, scat p-fr oom por, no stn, dull in fluor to Ls, micro-ool, v. p intr-xln por, no stn, no fluor. Sig inc Ls, lt tn-tn, lt -md gy, fn-xln, chlky in prt, no vis por to v.p. intr-xln por, no stn, no fluor, no odr, NS.



9
Tr's Ls, lt tn-tn, md-cse xln, gran, vit, rough surf textr, fr-gd vug por, no
stn, md min fluor, no odr, NS. w/Ls, lt tn-tn, md-xln, v. grainy-sli granulr
0 surf textr, p-fr intr-xln por, no stn, v. dull min fluor,w/ Ls, md-dk gy, v.fn-
xln, no por, no stn, NS w/ Clystns, lt-dk gy, grn-gy, tr rd.
Ls, tn-brn, lt tn-crm, v.fn-fn xln, no vis por, chlky in prt, no stn, no
fluor, w/Tr's Ls, lt tn-tn, md-xln, v. grainy-sli granulr surf textr, p-fr intr-
xln por, no stn, v. dull min fluor, no odr, NS W/Clystns, lt-dk gy, grn-
1 gy, tr rd. Tr Blk carb Sh, sli fissle.

Clystns, lt-md gy, grn-gy, tr rd. Ls, tn-brn, lt tn-crm, v.fn-fn xln, no vis
por, chlky in prt, no stn, no fluor, w/Much LS, md-dk gy, v.fn-xln, (limy
hrd clystn), no vis por, no stn, no fluor, NS.
2

Ls, tn-brn, lt tn-crm, v.fn-fn xln, no vis por, chlky in prt, arg, no stn, no
fluor, w/Ls, md-dk gy, v.fn-xln, (limy hrd clystn), no vis por, no stn, no
3 fluor, NS w/ Clystns, lt-md gy, grn-gy, tr rd.

Ls, tn-brn, lt tn-crm, v.fn-fn xln, no vis por, chlky in prt, arg, no stn, no
fluor, w/Ls, md-dk gy, v.fn-xln, (limy hrd clystn), no vis por, no stn, no
4 fluor,

Fld Sh, dk-gy to blk, carb sli-fissle, w/Clystns, dk-gy, md gy, sli silty
5 w/Ls, lt tn, chlky-fn-xln, carb, mealy, no vis por, no stn, no fluor, no odr,
NS.
Much Sh, dk-gy to blk, carb sli-fissle, w/Clystns, dk-gy, md gy, sli silty
6 w/Ls, lt tn to tn-brn, fn-xln, chlky, sli carb, p intr-xln por, no stn, no
fluor, no odr, NS.
Ls, tn-brn, micro-xln, no vis por, no stn, no fluor, w/Ls, lt tn, fn-xln ot
chlky, carb, no por, no fluor, no odr, NS w/Clystn, dk-gy to md gy, hrd,
7 limy, v. sli-silty.

Blk carb Sh, v.sli fissle-blocky, w/ Clystns, dk-gy to md gy, hrd, limy,
v. sli-silty, w/Tr's Chrt, smoke-tn, spkld blk, shrp, opq w/Ls, lt tn to tn,
fn-md xln, p-fr intr-xln in prt, scat p ppt por, iso fr ppt por, no stn, no
fluor, no dor, NS.
8 Fld Sh, blk-dk gy, carb , sli fissle w/Clystns, v.d gy-md gy, gr-gy, lt grn
,tr rd, **OREAD:**Ls, lt tn mottld lt-md gy, fn-md xln, arg to chalky, p intr-
xln por to no vis por, no stn, no fluor, w/Tr's Chert clr-wht-tn, shrp,
9 trnslnt-opq. w/ no odr, NS.
Ls, crm-tn, fn-md, xln, p-fr intr-xln por. Few: scat p ppt por, sli-chlky,
0 foss, grainy surf , scat brn carb prtgs, no stn, w/ Ls, brn-gy, fin-md xln,
1 p por, no stn, no fluor, no odr, NS.

●

Ls, lt tn-tn, fn-md xln, grainy to sb-granular surf textr, p-iso fr intr-xln
por, Few: iso fr-gd vug por, no stn, 1 pc: sptty dd gil brn stn, no fluor,
no odr, NS. Tr's \Ls, oom, p-oom por, no stn, w/ Clystns, dk gy to md
2 gy, grn-gy. Inc in Ls, gy-brn, fn-xln, no por, no stn.

Tr Blk carb Sh, sli-fissle w/Clystns, dk-md gy, grn-gy, tr's rd-brn, w/Ls,
lt tn-brn, fn-xln to chky, sli carb, mealy, soft, p intr-xln por, no stn, no
fluor, NS. W/Chlk, wht-lt gy.

3

Sig Inc Ls, crm, md-xln, v. grainy to granular surf textr, arg to chlky, p
intr-xln por, Few: scat p-fr ppt por, barren, no stn, no fluor,W/ Ls, crm-
wht & gr-brn, fn-xln to chlk, no vis por no stn, no fluor, no odr, NS.

4

Much Ls, wht-crm, fn-xln to chlky, p intr-xln por to no vis por, sm: carb
5 partings no stn, no fluor, NS w/Inc Clystn, gy-dk gy, grn-gy. Tr's of Blk
Carb Sh, fissle.

Blk carb Sh, w/Clystn, dk-md gy, grn-gy, w/ Ls, crm-lt tn, to mottld lt gy,
6 fn-md xln, p-fr intr-xln por, faintly faoss, grainy textr, no stn, NS.

Sh's & Clystns aa.Free foss frags: crin stems.
7
L/OREAD: Ls, crm-lt tn, fn-md xln, grainular to grainy surf textr, sli
foss, sparry, p intr-xln por, scat p ppt por, no stn, sptty md-brt min
8 fluor, luor, no odr, NS.

Ls, crm-lt tn, fn-md xln, grainular to grainy surf textr, sli foss, p intr-xln
por, scat p-fr ppt por, no stn, no fluor, w/ Md-stn, crm-wht, to gy-brn,
15" fn-xln to chlky, p intr-xln por, no stn, no fluor no odr, NS.
Sig inc Ls, crm, lt tn, tn-brn, fn-md xln, carb, gran to sli foss, sm chlk,
p intr-xln por, scat p-iso fr ppot por, no stn, no fluor, no odr, NS.
w/Clystns, dk-md gy, grn-gy, Tr's Blk carb Sh, sli-fissle.Inc Chrt, tn-
30" brn, shrp, opq-trnsl, to mottld wht-brn, gran, opq, fresh, NS.
–CFS
0 Ls, crm, lt tn, tn, fn-md xln, gran to sli foss, sm chlk, Sm: blk-dk gy lt-
brn carb foss /partings, p intr-xln por, scat p-iso fr ppot por, no stn, no
fluor, no odr, NS. W/Depth: Ls, crm-tn to lt -md gy, fn-md xln, intrlayred
1 w/chrt, wht, tn, p intr-xln por, Sm: scat p ppt por, no stn, no fluor, no odr,
NS w/Inc Blk carb Sh & Clystns, dk-md gy, grn-gy.

Fld Sh. Blk, carb, sli fissle, w/Clystns, v.dk gy to md gy, grn-gy, w/Ls,
tn, fn-md xln, p-fr intr-xln por, no stn, cherty, p min fluor, Sm pcs:
chlky, carb, no stn, no fluor, no odr, NS.

2

Ls, crm, tn mottld crm, fn-md xln, sli foss, (Free foss) carb & chlky in
3 prt, dolo in prt, p -fr intr-xln por , no stn, no fluor, no odr, NS. Fld
HEEBNER: Blk carb Sh, w/ micro-gas bbls bleeding from Shale.

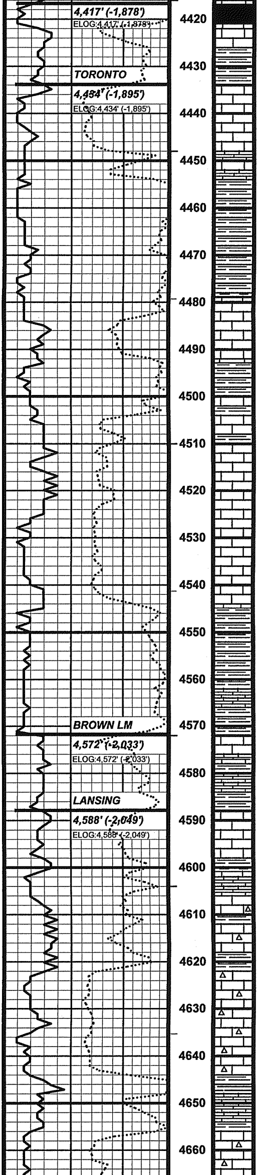
At 4228': VIS 50, WT 8.9

At 4260': VIS 49, WT 8.9

At 4322': VIS 48, WT 9.0

At 4354': VIS 45, WT 9.0

At 4380': VIS 45, WT 9.0



Much blk carb Sh, aa w/ Ls, tn mottld crm, lt tn, gy, v.fn to fn-xln, sli foss, carb & chlky in prt, p intr-xln por , no stn, no fluor, w/Ls, tn-brn, micro-xln, no vis por, no stn/fluor, w/Tr Ls, tn, sli oom, p-fr oom por,
4 arg, no odr, NS. w/ Clystns, dk-md gy, grn-gy,

5 Ls, crm mottld tn, dk gy, fn xln- chlky, arg, embdd carb mat, sli foss, p-fr intr-xln & iso scat p ppt por in grainy surf, no stn, fluor, or odr, NS.

6

TORONTO: Ls, crm mottld tn-brn, dk gy, fn-xln to chlky, embdd carb mat, sli foss, p. intr-xln por, no stn, no fluor, w/Ls, tn-brn, micro-xln, no vis por, no odr, NS. Tr's Chrt ,wht, shrp, opq.

7 Ls, crm, tn, fn-xln to chlky, faintly foss, sli-gran, embdd dk gy carb foss/partings, p intr-xln por, iso fr-gd ppt/vug por, no stn, no fluor, w/Ls, crm, fn-md xln, grainy, textr, p intr-xln por, sli foss, arg, no stn,
8 no fluor, no odr, NS. Sig inc in Clystns, dk gy, grn-gy, rd.

At 4448': VIS 46, WT 9.1

Ls, crm-wht, fn-md xln, dolo, sli foss p -fr intr-xln por, sparry, micro dots of carb mat, Clystns, dk-md gy, grn-gy, lt brn, rd-brn, w/Ls, md-dk gy, v. fn-xln, no vis por,l no fluor, no odr, NS. Tr's embdded foss frags, shells, crin stems.

9

Fld, blk carb Sh's, w/Clystns, dk-lt gy, lt grn, grn-gy, rd-brn, sm sli silty/sndy, w/Ls, crm, fn-md xln, rough grainy surf textr, p intr-xln, por scat p ppt, iso p-fr ppt/vug por, no stn, v.dull min fluor, no odr, NS.

At 4479': VIS 45, WT 9.0

0

Ls, crm, tn, brn fn-xln to chlky, foss to Ls, crm-wht, fn-md-xln, dolo, scat p-iso fr spty ppt por, gran in prt, embdd dk gy spks in prt, p intr-xln por, iso fr- ppt por, no stn, no fluor, no odr, NS w/Much Clystns,
1 grn, grn-gy, dk-lt gy, rd, brn, tn. Trs chrt, tn, crm wht, opq, shrp.

Clystns, dk-lt gy, grn-gy, lt grn, rd-brn, w/Ls, tn-brn mottld crm, fn-md xln, vit, embbd w/foss, gran inclusions, smooth-grainy surf textur, p intr-xln , no stn, no fluor, w/Ls, tn, oom, fn-md oom in prt, p oom por, no stn, no fluor, no odr, NS.

2

Ls, crm, sb-ool, foss in fn-xln matrix, p intr-xln por to no vis por, sli chlky in prt, no stn, v. dull min fluor, w/ Ls, tn, gy, v.fn-xln no vis por, no stn, no fluor, no odr, NS.

3 Ls, crm-tn-brn, foss in fn-xln matrix, p intr-xln por to no vis por, sli
4 chlky in prt, no stn, v. dull min fluor, w/ Ls, tn, gy, v.fn-xln no vis por, no stn, no fluor, no odr, NS. Tr's Chlk, lt gy, wht, crm, carb.

Ls, lt gy-crm mottld crm, micro to fn-xln to chlky, faintly foss/gran, p intr-xln por, no stn, p min fluor, w/Chrt, wht, tn, crm, shrp, opq.

5

Ls, lt gy-crm mottld crm, micro to fn-md xln to chlky, granulated, foss/gran, p intr-xln por, no stn, p min fluor, w/Chrt, wht, tn, crm, shrp, opq.Ls, tn-gy, micro-xln, conchodl, no vis por, no stn, no fluor, no odr,
6 NS. w/Ls's aa.

Ls, crm, tn, fn-md xln, p intr-xln por, tight, Sm: no vis por, no stn, no
7 fluor, Few: iso fr intr-xln /sli . Sm Chlk, wht, crm, lt gy. w/Clystns, dk-md gy, grn-gy. W/Tr's Chrt, tn-brn, wht, shrp, opq.

MUD-CO at 4555': VIS 45, WT 9.2, WL 11.2, LCM 0#, CHL 7,800 PPM

Ls, crm-tn, fn-md xln, fr scat p -fr ppt por ,barren, no stn, no fluor, no odr. Chlky-arg, with Clystns, dk-md gy, lt grn, md grn-gy, brn, rd, w/ Ls's aa.

8

Much Clystn, dk-md gy, lt grn, md grn-gy, brn, rd. **BROWN LS** : Tr's brn, crm-lt tn, Sm: mottled lt gy, micro-fn xln, no vis por to p intr-xln por, sli faintly foss in prt, no stn, scat p min fluor, no odr NS.

9

Tr's Ls, tn-brn micro-xln, no vis por , no stn, NS w/Much Clystn, dk gy-md gy, grn-gy. Ls, tn-crm, fn-md xln, sli foss, sparry, p-fr intr-xln por,
0 no stn, md min flor, no odr NS.

Inc Clystns, grn-gy, lt-dk gy, w/Ls. Mottld brn-tn-crm, fn-xln, sb-gran, sb-foss, arg, sparry, p inter-xln por, no stn, sptty min fluor, no odr, NS.

1

LANSING: Fld Ls, crm-lt tn, fn-md xln, sli foss,sub-gran, sparry, chlky, p intr-xln por, Sev:scat p-fr ppt por, no stn, dull sptty, min fluor, no odr, NS. Tr's Chrt, wht, tn, crm, opq, shrp-blcky. Appears w/Depth: darker gy, finer-xln, chlkier, poorer por development.

At 4604': VIS 52, WT 9.2

2 Ls, crm to lt tn-brn, gy, arg, earthy, fn-xln, carb, chlky, p intr-xln por, no stn, dull min fluor, no odr, NS w/Inc Clystns, dk-lt gy, grn-gy. Tr's
3 Chrt, smoke-dk gy, opq, shrp.

Ls, crm mottld tn to brn, fn-xln, chlky, inc embdd carb/foss mat,
4 sparry, calc inclusions, p intr-xln por, no stn, scat md sptty min fluor, no odr, NS, w/Clystns, aa. Tr's Chrt, wht, gy, opq, shrp.

Ls, crm, mottld lt tn, brn, sm: lt gy, v.fn-md xln, chlky to sparry (calc inclusions), tr's embdded gy foss mat frags, arg, p intr-xln por to no vis por, no stn, sptty dull min fluor, no odr, NS, tr Chrt, wht, tn.

5

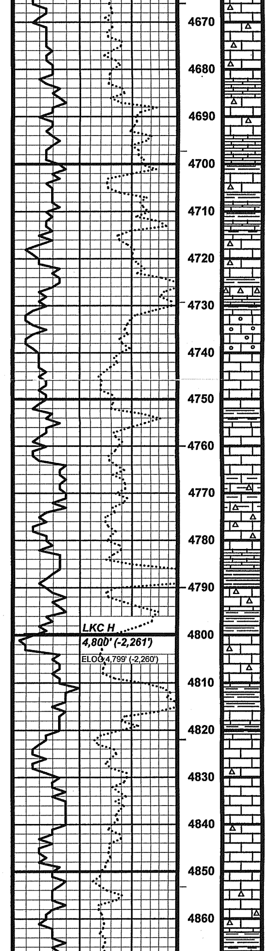
Ls, crm mottld lt gy to tn, fn-md xln, sparry, sli faintly foss, arg to chlky, p intr-xln por, no stn, sptty dull min fluor, no odr, NS. Tr's Chlky, wht, Chrt, gy-dk gy, opq, shrp.

6

Tr's Sh, blk, carb, fis,/Clystns, dk-md gy, md grn-gy, lt grn rd, w/Ls, crm-
7 mottld lt gy, fn-md xln, vit, sm: sptt d carb flks, no stn, sptty dulll min fluor, no odr, NS. Tr's Chrt, gy, dk gy-tn, brn, trnslt-opq, shrp.

Ls,crm mottld lt gy, fn-md xln, chlky in prt, arg, sparry, p intr-xln por, non stn, v.p. min fluor, no odr, NS w/Ls, tn-brn, micro-xln, no vis por, no stn, NS. w/Tr's Blk carb Sh, sli fissle, Clystns, dk-md gry, grn-gy. Tr's Chrt,
8 blk, conchodl, tn, lt gy, shrp, opq. w/Chlk, wht.

At 4666': VIS 54, WT 9.2



Ls, crm mottld lt gy, micro-xln, no vis por, chlky, no stn, no fluor, w/Ls, crm, fn-xln, sparry, p intr-xln por, arg, earthy, no stn, no fluor, no odr, NS.w/Chrt, blk, lt gy-wht, blu-wht, aa, w// Clystns, v.dk gy to md gy, grn-gy, tr rd.

9

Ls, crm to tn to brn, micro-fn xln, arg, chlky in prt, inc blk carb partings, p intr-xln por to no vis por, Few pcs iso p ppt por, tight, no stn, no fluor, no odr NS. w/Chrt aa, Tr's Chlk, wht.

0

Ls, crm lt tn, arg, chlky, carfb, fn-xln, po por, no stn, w/Ls, tn-brn, micro-xln, no por, no stn, w/Sig inc Clystns, dk--md gy, grn-gy, grn, rd-brn, Tr's Blk carb Sh. & Chrt, blk w/wht spicules, conchdl, shrp.

1

Ls, brn mottld tn, fn-xln , p intr-xln por, no stn, no fluor, no odr, w/Tr's Ls, crm, fn-md xln, p intr-xln por to no vis por, no stn, v.p.min fluor, no odr, NS. Tr's Chrt, blk wht spicules, conchdl, opq.

2

Ls, mottld crm-brn, fn-md xln, p intr-xln por to no vis por, chlky, carb in prt, no stn, v.p.min fluor, no odr, w/Ls, brn, micro-xln, dse, no vis por, no stn, NS, w/Clystns, dk-md gy, grn-gy. w/Chrt, blk aa. brn, shrp.

3

Ls, crm-lt tn, fn-md xln, granulr textr, sparry-calc incl in micro-frac/s, (Mst: arg, to chlky) , p intr-xln por, no stn, v. sptty dull min fluor, no odr, NS. w/ Chrt , blk, dk brn, tn,blu-gy w/ wht spic, conch, shrp, opq.

4

Ls, crm mottld tn to dk brn, fn-md xln, carb in prt, sb-gran textr in prt, p intr-xln por, no stn, no fluor, no odr, NS w/Inc Clystns,dk-md gy, grn-gy.

5

Ls, crm-lt gy, chlky, fn-xln, v. grainy surf textr, abdt p ppt's to iso fr ppt por, no stn, no fluor, no odr, NS. w/Ls, crm, fn-md xln, p intr-xln por, v.sli foss, no stn, no fluor. W/Ls, crm-mottld brn, fn-xln, chlky, no por no stn, NS. Dk gy, blk Sh bldg micro-bbls gas.

6

Ls, crm, fn-md xln, grainy, arg, sparry, chlky, scat-iso p ppt por in prt, no stn, no fluor, inc carb mat, w/Ls, brn, micro-xln, no por, no stn, w/Clystns, aa.w/ Chrt, blk, dk brn, tn, blu-gy w/ wht spic, conch, shrp, opq.

7

Tr's Ls, lt gy-crm, fn-md xln, chlky, v. grainy surf textr, scat p-fr ppt por, no stn, no fluor, Ls, crm, v.fn-fn xln, foss shell frags/casts, no por to p intr-xln por, no stn, no fluor, no odr, NS, w/Ls, lt tn, fn-md xln, sli-grainy surf textr, p intr-xln por, no stn, no fluor, NS.

8

Ls, lt tn-crm, fn-cse xln, spary, to chlky, carb in prt, p-iso fr intr-xln por, no stn, no fluor, no odr, NS, w/Much incr Clystns, dk gy-blk, w/Chrt, blk, dk brn, tn, blu-gy w/ wht spic, opq.Tr trip por-sli-burn discoloration- deemed not stn,

9

Inc Clystns, dk-lt gy, New: Inc Clystn: pale gy-grn-blue, ochre, Ls, lt gy-tn, fn-md xln(in prt), faintly grn, sli-sparry, p intr-xln por, v. sptty dull fluor, no stn, no odr. Most: Ls, crm-lt tn, chlky, no vis por, no stn, NS. Sm: Ls intrlyrd w/wht Chrt.

0

Tr's Blk carb Sh, Clystns, dk-md gy, grn-gy, w/Much Ls, crm, lt tn, tn, v.fn-fn xln, arg, to chlky , p intr-xln por, Sm; carb partings , intrlayerd w/wht chert, no stn, no fluor, no odr, NS.

1

Tr Ls, crm mottld/intrlyrd w/ v.lt grn-gy, tn chrt; crm: scat p-fr dissolution ppt por in contact to lt grn gy v.fn xln chrty matrx, no stn, dull min fluor. W/Ls, crm, tn-brn, crypto-xln, *no vis por, no stn,* no fluor, no odr, NS. w/tr's Blk carb Sh, hrd, sli fissle bldg micro-gas bbls & Clystns, lt-dk gy, pale lt grn-gy, rd-brn.

2

3

Fld Clystns, v-c: lt-dk gy, grn-gy, ochre, tr's blk carb Sh, bldg micro gas bbls, w/Chrt, blk, dk brn, tn, blu-gy w/ wht spic, opq.w/Ls, crm-tn, fn-xln, arg,-chlky, sli carb in prt, p intr-xln por, Mny: no vis por, tight, no stn, no fluor, no odr, NS

Most: Clystns, v-c: lt-dk gy, grn-gy, ochre, tr's blk carb Sh; Ls, dk tn, crypto-xln, no vis por, tight, no stn, w/Ls, crm-lt tn, fn-xln, arg, chlky in prt, no por to v. p intr-xln por, no stn, no fluor, no fluor, NS, w/trs Chert, brn w/wht ool inclusions, conchodl, shrp.

4

Ls, crm-wht, md-xln, embdd foss frags,chlky matrx, p-fr intr-xln por, no stn, no fluor;.Ls, crm-lt tn, fn-xln, p intr-xln por, arg-chlky, no stn, no fluor w/trs Chrt, gy, brn, dk gy, opq-trnslt, shrp.

5

Tr's Ls, wht- crm, sb-gran, iso p-fr intr-gran/intr-xln por, chlky, no stn, no fluor, intrbdd w/Chrt, lt gy-wht, opq, blocky. W/Ls's aa, crm, fn-xln, chlky, no stn, p por, NS.

6

Fld Sh, dk-gy-grn, md gy-grn, lt grn, brn-rd, Tr blk carb Sh, w/Ls, crm, wht, tn, v.fn-fn xln, arg to chlky, p intr-xln por,no stn, scat p min fluor, no odr, NS. Trs Ls,crm-wht, chlky, gran/foss, p ppt por, no stn, p min fluor, no odr, NS.

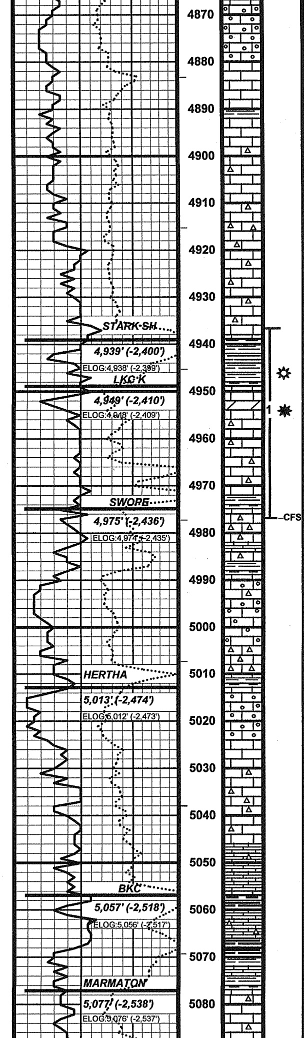
7

Tr's Ls, crm, fn xln, grainy txtr, arg-chlky, scat p-fr ppt por, no stn, no fluor, tr's sparry, foss, iso p ppt / vug por, no stn, dull min fluor, w/Ls, crm, chlky, dk gy-tn inclsns, p intr-xln por, no stn, no odr, NS.

8

At 4729': VIS 45, WT 9.2

At 4822': VIS 45, WT 9.3



Fld Ls, wht, crm, crypto-xln, chlky wht matrix, p intr-xln por, iso p ppt & intr-foss por, no stn, no fluor, Most: Ls, crm-tn, fn-md xln, embedd foss/ Ls frags p intr-xln por, no stn, no fluor, no odr, NS.

9

Ls, crm, lt gy, crypto-xln, chlky, Sm: fn-suc, arg, chlky in prt, no vis por to p intr-xln por, no stn, no fluor, w/Chrt, brn, crm, lt gy, clr, trnslt-opq, shrp. w/Sh's, dk gy-grn, dk-lt gy, grn-gy, rd-brn, Tr Blk carb Sh. W/ Chlk, wht.

0

Ls, crm, lt gy, crypto-xln, Sm: fn-suc, arg, chlky in prt, no vis por to p intr-xln por, no stn, no fluor, w/Few: embdd w/ foss frags, W/Ls, crm-tn, embdd w/dk gy foss /carb inclusions, w/ Chrt, brn, crm, lt gy, clr, trnslt-opq, shrp.

1

Ls, dk tn-brn, crm, crypto- xln, no vs por, no stn, no fluor, intr-lyrd w/Tr's Chrt, blu-gy mottld wht, opq, blocky, & occ embdd foss frag, w/Sh, blk, carb, fissle &Clystns, dk gy-grn, gy-grn, lt grn, rd-brn.

2

Ls, dk tn-brn, crm, crypto-xln, no vs por, no stn, dull min fluor, intr-lyrd w/ occ embdd foss frags & tr's Chrt, blu-gy mottld wht, opq, blocky, gy, tn, trnslnt, shrp-blcky.

3

Inc in Ls, dk tn-brn, crypto- xln, no vis por, no stn, dull min fluor, intr-lyrd w/ Tr's Ls, crm-wht, chlky, fn-xln, no por no stn, w/Tr's Chrt, gy, tn, trnslnt, shrp-blocky.Sm Clystn dk gy.

4 Ls, dk tn-brn, crypto- xln, no vis por, no stn, no fluor, intr-lyrd w/ Ls, crm-wht , fn-xln, chlky, no por no stn, & tr's Chrt, tn, brn, shrp-blocky.

5 Much Ls, brn,tn, micro-xln, dse, no vis por, no stn, no fluor. Few pcs:frac-faces w/duse xls-brt fluor, NS. w/Ls, crm, fn-xln, chlky, v.p. intr-xln por, no stn, no fluor, no odr, NS. (Gas kick recorded in this

6 interval but sample show was not). (S.O.Top of LKC?)

LKC K: Num: Ls, crm-wht, dolo, fn-md-suc, grainy, sparry, chlky in prt, p intr-xln por, v.lt evn stn and sat on num pcs, FSFO (v. lt brn-brt gldn fluor-high gravity), good swt fleetng oily odr, brt yel fluor. Tr gas bbls.

7

Ls, crm-wht, fn-md xln, grainy surf textr,chlky, faintly sli foss, p intr-xln por, iso p ppt por, no stn, barren, no stn, v. dull min fluor, no odr, NS.

77 w/Chrt, lt tn-tn, trnslnt, shrp.

15"
30"

Ls crm, fn-xln, v.sli-foss, embdd w/ wht chrt, p intr-xln por, v.dull min fluor, no stn, no fluor, NS. w/Clystn, lt grn, grn-gy. & Chlk, wht.

SWOPE Ls, crm-lt tn, tn, brn, micro-xln, dse, no visp por, no stn, no fluor, w/Ls, lt tn, fn-xln, w/blk carb laminatins, no vis por, no stn, no fluor, w/ chrt, tn, brn mottld wht to lt gy, trnslnt-opq, shrp.Sig inc Sh,

0 blk, carb; grn-gy, dk-gy.

Much Clystn, v-c: pale grn-gy, lt-md gy, rd-brn, tr's Sh, blk, carb, w/Ls, tn-brn, fn-xln, mealy, p intr-xln por,no stn,no fluor,no odr, NS.

1

Tr Ls, crm, sb-gran/ool, embdd frags, fn-md xln, p to iso fr ppt/vug intr-xln por, no stn, no fluor, Much Chlk, wht, Chrt, lt gy-conchdl, trnsl, brn,blk, conchdl,opq,shrp; Ls, tn-brn, fn-xln, no stn, no fluor, no odr,

2 NS.

Ls, crm-mottld lt gy, fn-md xln, sb-gran, foss, embdd frags,chlky, p. intr-gran/xln por, no stn, no fluor, no odr NS. w/ Chlk, wht, w/ Clystns,

3 lt grn, lt-md grn-gy, md-dk gy, rd-brn.

HERTHA Ls, crm-tn, fn-md-xln, arg, sb-gran to grainy, mostly tight, chlky, p intr-xln por, no stn, no fluor, no odr NS, w/Ls, tn-brn to dk gy, fn-xln, no vis por, no stgn, Chrt, dk brn, gy, wht, tn, translnt-opq, shrp-blocky,

2

Ls, tn-brn to dk gy, fn-xln, no vis por, no stgn, Chrt, dk brn, gy, wht, tn,

4 translnt-opq, shrp-blocky,

Ls, dk-gy, dk brn, crypto-xln, no vis por, no stn, no fluor; Mudstn, crm-tn, mealy, chlky, faintly foss, no vis por, no stn, no odr, NS w/Chrt, blk, dk gy, dk brn, concdl, opq.

5

Fld Ls, dk brn, brn, tn-brn, dk gy, lt tn, Sm: sli silty, crypto-fn xln, no vis por-p. intr-xln por, tight, dse, no stn, no fluor, no odr, NS. W/Tr's

6 Chrt, brn, lt tn, clr, opq, conchdl-shrp.w/Clystns, lt gy, slty.

Ls, dk brn-gy, dk gy, micro-fn-xln, no vis por, no stn, w/Ls, lt brn, fn-xln, slity-gritty texture, dse, no vis por, no stn,no fluor, no odr, NS. w/Chrt, dk-brn, tn, lt tn, opq, shrp-conchodl. **BKC:** Tr Blk Carb Sh.

7

Ls, dk brn-gy, dk gy, micro-fn-xln, no vis por, no stn, w/Ls, lt brn, fn-xln, slity-gritty texture, dse, no vis por, no stn,no fluor, no odr,

8 NS.w/Chrt, dk-brn, tn, lt tn, opq, shrp-conchodl. Tr Blk Carb Sh.

Sh, blk, dk-gy, brn w/Ls, dk brn-gy, dk gy, micro-fn-xln, no vis por, no stn, w/Ls, crm-lt tn, fn-xln, no vis por, no stn,no fluor, no odr, NS. w/Chrt, dk-brn, tn, lt tn, opq, shrp-conchodl.

9 **MARMATON:** Ls, lt crm-gy & lt tn, crypto-fn-xln, sli-conchdl, hrd, no vis por, no stn, dull min fluor, Few: sli-chlky; Ls,lt gy- crm, fn-xln, grainy-platey surf textr, sli-chlky, no vis por, no stn, no odr, NS.

At 4915': VIS 45, WT 9.3

Strap at 4,977':
Boards: 4,977.46
Strap: 4975.04
Short: 2.32'

DST #1: 4,937'- 4,977'
LKC 'K'

5" - 30" - 30" - 30"
IF: Weak blow, 1/4" ISI: No blow,
FF: Very weak intermittent surface blow
FSI: No blow

RECOVERED

12' Drilling Mud (No Oil Show)

IFP: 18 - 20# / 20 - 24#
SIP: 1156 - 197#

Temp: 108 Degrees F.

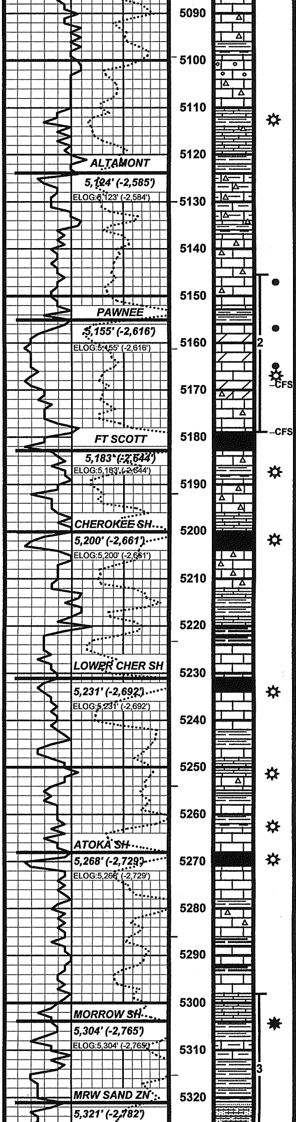
At 4945': VIS 45, WT 9.3, LCM 2#

SHALE GAS UNIT KICK:
Lags to 4,947'
HW: 167 u, C1: NA

FORMATION GAS UNIT KICK:
Lags to 4,957'
HW: 151 u, C1: NA

MUD-CO at 4977': VIS 50, WT 9.35, WL 9.6, LCM 2#, CHL 8,900 PPM

At 5070': VIS 54, WT 9.3, LCM 1#



0

Ls, crm, fn-xln to chlky, faintly foss, granular surf texture, p intr-xln por to no vis por, v.dull min fluor, no odr, NS. Few: Ls, crm, v.fn-xln, faintly ool, no vis por, no stn, no min fluor, NS. Tr's Sh, blk-carb, fissle, dk-gy,
1 w/Tr Chrt, mottld lt-dk gy, opq, shrp.

Ls, crm, fn-xln, faintly ool/gran/sli fos in fn-xln matrix. v. p intr-xln por, no stn, scat ptty min fluor, no odr, NS, w/Ls, lt tn-tn, fn-xln , no vis
2 por, no stn, no fluor, w/ Inc Clystns, dk-gr, dk grn-gy, grn, rd-brn, Sm: Carb, no odr, NS.

Fld Ls, crm to lt tn, fn-md xln, sb-ool/foss, granular surf textr, sm: chlky, p intr-xln por, no stn, fr min fluor w/Ls, lt-tn, crptoo-xln, no por,
3 NS w/inc Clystns, grn, grn-gy, lt-dk gy, rd-brn, Tr Chrt, brn, opq-trnslnt.

Ls, crm-lt tn, fn-xln to chlky, carb in prt, faintly ool, foss, platey surf textr, v.p.intr-xln por, no stn, md min fluor, no odr, NS. w/Clystns, lt-pale grn,
4 lt gy, w/carb prtings w/pyr;Tr Chrt, brn, mottld, sharp, opq.

Fld Ls, crm, crypto- fn xln, sli chlky in prt, p intr-ln por, md min fluor, Few: embdd foss/ls/carb frags, tr pyr, no stn, w/Chrt, tn-crm, opq-
5 trnslt, shrp. Sm Clystns, lt grn-gy, med gy.

Most: Ls, lt tn, crypto-fn xln, p intr-xln por, chlky in prt, no fluor, no stn, NS.Tr' Ls, lt-tn, fn-md xln, grainy (dolo?) surf texture, p intr-xln por, sli
6 chlky, v. brt gldn-wht fluor, bldg high grav clr-v.lt tn oil droplets, v.lt to no oil stn, v. sli fleetg odr.

5169: Few pcs: as above with v. sptty fluor. Mostly Ls, lt tn, crypto-xln,
69
15" v. p por, iso sptty fluor, VSSFO (clr-fluor) micro-bds when brkn.

PAWNEE: Much Ls, crm-lt tn, fn-xln, partially dolo, grainy, p intr-xln
30" por, no stn, no fluor. Sev: appear to be foss bed clstr of rdd coral frags: encrusted with grainy-gran dolo matrix, iso p ppt por, Num brt wht-yel fluor, bleedg high grav oil-clr to v.lt tn, fleetng ligt sweet oily
45" odr, most barren few light evn tn stn,

15" Few pcs: foss frags dolo show aa. Mst Ls, lt tn, crm, fn-xln to sli suc, dolo, arg to chlky, p intr-xln por, no stn, md min flluor;W/depth the oily
30" odr diminished, NS, w/Sm: lt gy-crm, chlky, p-fr ppt /intr-xln por, no stn, p min fluor, w/intrlyrd Chrt, lt gy-tn, crm, opq, shrp.

Fld Sh, blk, carb, fizzing micro-gas bbls, w/Clystn, dk-gy, dk grn-gy, grn (carb), brn, **W/FT.SCOTT:** Ls, crm-lt tn, v.fn-fn xln, faintly foss, p intr-xln por, no stn, w/Chrt, mottld wht-gry, foss, clr-wht, p intr-xln por, no stn,
0 mst: no fluor, Few: md brt min fluor, no odr, NS.

Ls, crm-lt tn, fn-xln to chlky, arg, platey, v.sli foss inclusns, p intr-xln por to no vis por, no stn, p-md min fluor, no odt, NS w/ Ls, tn-brn,
1 micritic, no por, no stn, NS, W/Much Sh blk-dk gy,carb(gssy), w/Clystns, grn(blk carb prtgs), grn-gy, brn. Tr's Chrt, tn-brn, crm, opq.

CHER SH: Much Sh, blk, carb, fizzing micro-bbls gas, Clystns, dk-gy, dk gnr-gy, grn, rd-brn, Ls, crm-lt gy, tn, brn, fn-md xln, sli grainy surf textur, arg to chlky in prt, p intr-xln por to no vis por, intrlyrd w/chrt, wht,
2 crm, tn,brn,no stn, scat dull min fluor, no odr, NS.

Ls, crm-tn, fn-md xln, sb-gran, embdd w. rdd ls grns, chlky, p. intr-xln por, no stn, no fluor, w/ Ls, wht-crmbrn, fn-xln to chlky, no por, no stn,
3 no fluor, NS. W/Clystn,blk, dk-lt gy, grn-gy, tr bn-rd.

Ls, crm, lt tn, brn, gy, mottled, foss-sb gran, v.fn-fn xln, carb in prt, chlky, tight, dse, p intr-xln por, no stn, scat dull min fluor, no odr, NS .
4 Ls, tn-brn, micritic, no stn, no fluor, NS. w/Clystns &Sh, blk aa.

Ls, mottld crm-lt tn,brn, gy, fn-md xln, arg, chlky in prt, sb-foss/ gran in prt, p intr-xln por, dull min fluor, w/Tr Ls, brn, fn-ln, vit, platy, no vis por, no stn, no odr, NS. w/Sh, blk, carb w/Clystns, dk-lt gy, grn-gy, tr bn-rd.

5

Ls, mottld crm-lt tn,brn, gy, fn-md xln, arg, chlky in prt, sb-foss/ gran in prt, p intr-xln por, dull min fluor, Tr's Ls, blk-gry, fn-xln , hrd, no vis
6 por, no stn. no odr, NS. w/Sh, blk, carb w/Clystns, dk-lt gy, grn-gy, tr bn-rd.

Much Sh, blk, carb, sli fissle, bleeding micro bbls gas, w/Ls, lt gy-md gy, fn-md xln, sli-foss, carb, p por, no stn, no fluor, no odr, NS. W/ Ls, tn mottld gy, v.fn-xln, dse, sli carb, no por, no stn, no fluor, NS. Tr
7 Chrt, blk mottld wht, blocky, v. hrd, dse.W/Clystns, aa.

Ls, lt gy-md gy, fn-md xln, sli-foss, carb, p por, no stn, no fluor, no
8 odr, NS. W/ Ls, tn mottld gy, v.fn-xln, dse, sli carb, no por, no stn, no fluor, NS.

ATOKA SH: Much Clystn, dk-md gy, dk grn-gy, grn, (calc inclusns) tr blk carb Sh, bledding gas, w/Ls, tn-brn, v.fn-fn xln, carb, no vis por, no stn, no fluor, w/Ls, lt gy-tn, micro-xln, dse, no por, no stn, NS.

9

Fld Ls, crm-lt tn, fn-xln, sli grainy surf textr, arg, sli chlky, sli carb spts-micro foss frag inclusns, sparry, p intr-xln por, no stn, no fluor, Sptty min fluor Tr's Chrt, crm, tn, opq, shrp. w/Chlk, wht, lt gy.

0 Ls, crm-tn, lt gy, brn, fn-md xln, arg, chlky /foss in prt, p intr-xln por to no vis por, no stn, no fluor, no odr, NS. w/ Much Clystns, dk-gy, dk-grn-
1 gy, grn-gy, grn (carb-lam), lt md gy, brn, Tr rd-brn,

Ls, crm-tn, v.fn-md xln, arg, chlky in prt, p intr-xln por to no vis por, tight, no stn, Num: Brt gld fluor, rel micro-bds clr-pale yel oil when
2 brkn and many gas bbls, fnt swt odr

Ls, tn mottld brn, fn-md xln, arg, chlky, p intr-xln por, tight, no stn,
3 Num: Brt gld fluor, rel micro-bds clr-pale yel oil when brkn and ali Gas show, fnt fleetng odr. w/Depth: More Clystns
36

15" Ls, tn, brn, fn-xln, p intr-xln por, arg, chlky, no stn, no fluor. w/Much Sh, blk, carb, sli fiss, Clystn, dk-gy-gy, w/tr's Chrt, brn, trnsl, shrp.

30" Sh, Clystn and Ls aa, w/Tr's Sd grns, unconsol, clr, ambr, rose, fn-md grn, sb-ang-sb-rdd, no stn, no fluor, no odr, NSFO/G.

At 5099': VIS 55, WT 9.4, LCM 1#

FORM. / SHALE GAS UNIT KICK:
Lags to 5,113'
HW: 88 u, C1: NA

MUD-CO at 5138': VIS 50, WT 9.35, WL 11.2, LCM 2#, CHL 9,800 PPM

DST #2: 5,146'- 5,179'
PAWNEE

5" - 30" - 60" - 60"
IF: Weak blow from 1/4" to 3/4" ISI: No blow
FF: Weak blow building form 1/4" to 1" that was sustained throughout , FSI: No blow
RECOVERED
90' GAS IN PIPE
35' TOTAL FLUID
35' Sli-Oil Cut Mud (<1% OIL)
IFP: 19 - 21# / 22 - 33#
SIP: 1573 - 1426#
Temp: 111 Degrees F.

FORMATION GAS UNIT KICK:
Lags to 5,168'
HW: 108 u, C1: NA

MUD-CO at 5179': VIS 59, WT 9.4+, WL 9.6, LCM 2#, CHL 10,000 PPM

SHALE GAS KICK:
Lags to 5187':
HW: 111u, C1: NA

CHEROKEE SHALE GAS KICK:
Lags to 5208':
HW: 162u, C1: NA

At 5223': VIS 62, WT 9.4, LCM 1#

LOWER CHEROKEE SHALE GAS KICK:
Lags to 5237':
HW: 67u, C1: NA

SHALE GAS KICK:
Lags to 5251':
HW: 73u, C1: NA

SHALE GAS KICK:
Lags to 5263':
HW: 38u, C1: NA

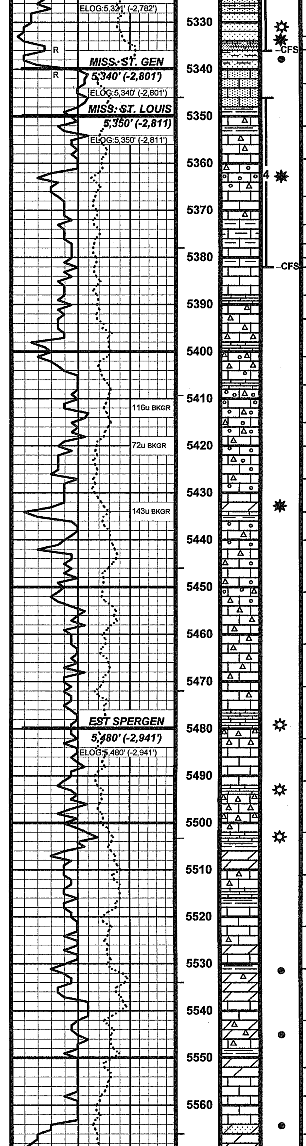
At 5270': VIS 56, WT 9.4, LCM 1#

MRW SHALE GAS KICK:
Lags to 5304:
HW: 62u, C1: NA

DST #3: 5,298'- 5,336'
MORROW SAND

5" - 30" - 60" - 60"
IF:Fr blow from 3" to 7" ISI: Weak blow to 1/4"
FF: Weak blow bldg 1/2 to 2-1/4" throughout, FSI: No blow
RECOVERED
125' GAS IN PIPE
15' TOTAL FLUID
15' Drilling Mud
IFP: 14 - 12# / 13 - 16#
SIP: 31 - 39#
Temp: 112 Degrees F.

FORMATION GAS KICK:
Lags to 5331':



45" Unconsol Sand, in lt grn-gy gumbo matrix, v.fn-grn-med suc in textur, v.fri, well srtd, much unconsolidated & fall apart to hold clstr. Spl tray: Gd show of free oil, lt brn, fluor, good swt odr; l clstr: lt brn, fully sat/stn and brt yel fluor.

5 Ls, crm, v.fn-xln, gran, foss, sli fluor, no stn,Tr SS clstr, lt brn, sli-grn, v.fn grn, w.srtd, evn stn/full sat, tight, bleedg FSFO, live md-brn oil, fr odr. SS Clstrs, lt grn,cly-filled,no por, NS.r Clystn, lime-grn; Calcarenite, wht, sndy.

6 **ST GEN:**: Calcarenite, wht-lt grn, sndy, p intr-xln por, no stn, NS. w/Clystns, lt-md gy, dk gy, Sh, blk, carb, fissl. w/Chrt, org-red, spttd, opq-trns. Brn-tn, trns-opq.

7 **ST. LOUIS:** Ls, crm, lt gy, lt tn, v.fn-md xln, faintly foss, gran textr, sli chlky in prt, occ scat glauc spts, v. dull min fluor, no stn, Chrt, org-tn, NS. Clystns, md grn-gy, lt-md gy.

8 Ls, crm, gran-sb gran, in fn-xln matrix. Few: iso fr-gd dissolutn vug-ppt por, lt evn stn, patchy gldn fluor, lt fleetg swt oily odr. Few: iso p-fr ppt por, unevn stn. Generally tight overall.

82 W/Depth: Ls, wht, gran, v. chlky, p to no vis intr-xln por, no stn, p fluor, no odr, NS. w/Tr's Chrt, clr-tn, brn, trns-opq, shrp.

15"
Ls, wht, gran-platy, rough surf, faintly foss, p intr-xln por, dull min
30" fluor, no stn, no odr, NS. w/inc in Clystn, lt-grn-gy, lt-md gry.
45"

0 Ls, wht-crm, crypto-fn xln, faintly sb-ool/gran, chlky in prt, p intr-xln por, dull min fluor,no stn,no odr,NS;Clystns,lt-gy-grn,md gy,rd-brn.

O5 Ls, aa w/Tr Ls, lt pale grn, lt crm, crypto-xln, sli-trnsl, no por, no stn, faintly sb-gran, tr's Chrt, tn,trnsl, v.dull min fluor, no odr, NS.

1 Ls, wht-crm, crypto-fn xln, sb-ool/gran, chlky in prt, p intr-xln por, no stn, intrlyrd w/ Chrt,, clr-crm-tn-org, fire red, spkld, trnsl, shrp.

15 Chrt aa intrlyd w/Grnstn, wht, gran/ool embdded in silica matrx, foss, arg, no intr-gran por, no stn, dull min fluor, no odr, NS.

2 Ls, wht-crm, ool/gran, chrty matrix, arg, no vis intr-gran por, no stn, w/Ls, lt gy, embdd mini grns, "sandy" , spkld, fri, p-fr intr-gran por, no stn, no fluor, no odr, NS,Clystn, dk-lt gy.grn-gy.

3 Ls, lt gy, "sandy", gran, fri, spkld, p-fr intr-gran por, iso glauc, spts aa; Tr's Chrt, wht, lt gy-tn mottld wht;Sh's. dk-gy, blk, lt grn-gy.

4 Ls, wht-crm, gran/ool embdded in fn-xln matrix, foss, arg, no intr-gran por, iso spks glauc,no stn,dull min fluor,no odr, NS.Tr's Chrt, lt gy-tn mottld,opq-wht,foss, Tr's Sh, blk, carb,Clystns, lt grn-gy.

45 Tr Ls, lt gy-crm, gran, dd flky oil stn btwn grns, no intr-gran por, no fluor, NS.w/ Inc Clystns, grn-gy, gy, blk lam, w/Ls, crm, sb-gran aa.

5 Dol, lt gy, crm-gy, v.fn-fn suc, tight, chlky in prt. No stn, no fluor, 1 pc: micro-bds rel whn brkn (brn flky res oil),v. lt odr (sour?).Ls, wht-crm, gran/ool,foss aa.Clystns, grn-gy, gy, blk lam, Tr Sh, blk, carb

6 Ls, lt gy, embdd mini grns, "sandy" , spkld, fri, p-fr intr-gran por, no stn, no fluor; Ls, crm-wht, fn-md xln, ool-gran, arg, chlky in prt, p intr-xln por, no stn, no fluor; Tr's Chrt, clt-gy, crm, tn, opq-trnsl, shrp.no odr, NS.

Fld Ls, crm-lt gy, fn-xln, chlky embdd, w/rdd ls pebbls/ool, iso scat glauc spts, p. intr-xln por, no stn, no fluor w/Chrt, wht, crm, tn, mottld, foss, no odr, NS.

7

8 Ls, crm-lt gy, fn-xln, chlky embdd, w/rdd ls pebbls/ool, iso scat glauc spts, aa; Ls, wht, crypto-xln, faintly ool, no vis por, no stn, no fluor, w/Chrt, wht-clr, lt gy, trnsl embdd ls frags; Chlk, wht.

9 Ls, crm-lt gy, crypto-md xln, platey, grainy, sb-gran, faintly ool, chlky in prt, p intr-xln por, no stn, no fluor, no odr, NS Tr's Chrt, crm-lt org, trnsl, shrp, tr blk, carb sh w/Clystns, lt grn-gy.

0 Fld Chrt, wht ,clr, smoke, crm, tn, mottld, trnsl-opq, shrp-conchdl, sm blcky, w/Ls crm, crypto-xln to fn-xln, no vis por to p intr-xln por, no stn, arg, platey, p intr-xln por, no fluor, no odr, NS.

Ls crm, crypto-xln to fn-xln, no vis por to p intr-xln por, no stn, arg, platey, p intr-xln por, no fluor, no odr, NS.w/Chrt, wht ,clr, smoke, crm, tn, mottld, trnsl-opq, shrp-conchdl, sm blcky,

1

2 Dol, lt gy-crm, v.fn-fn suc, sli chlky in prt, p intr-xln por, no stn, dull min fluor, NSFO, NSG intr-lyrd w/Ls, crm-lt tn,crypto-xln to fn-xln, platey, arg, p intr-xln por, no stn, no fluor, w/Chrt, clr, smoke, crm, tn, mottld, trnsl-opq, shrp-conchdl, sm blcky, no odr, NS.

Tr Dol, lt gy-wht, Sm: v pale gr mottld lt tn, v.fn-md suc, sli chlky in prt, p-f intr-xln por, no stn, dull min fluor, Few:tn-brn inclusns, no odr, NSFO, NSG, Inc Clystns, lt grn-gy to md-dk gy, Tr's blk..

3

4 Fld Clystns, lt grn-grn gy, lt-dk gy w/blk carb lam, brk-brn, Tr Ls, crm, gran in fn-xln, p por, md min fluor, w/Tr's Dol, lt gy-wht, fn-suc, chlky, p intr-xln por, no stn, no fluor,Tr Chrt, lt tn, crm, no odr, NS.

Tr Dol, lt gy-grn mottld brn (stn), md suc, fr intr-xln por, unevn brn stn, brt fluor, VSSFO micro bds when brkn, no odr, (lt gy-grn portion: sli chlky-tt). Much Clystn aa with Ls, crn-lt tn, fn-md xln, chlky, no stn, p min fluor, NS

5

6 Dol, lt gy-crm, v.fn suc, p intr-xln por, no uneven brn stn, no fluor, Tr Dol, lt grn mottld brn, md-suc, fr -intr-xln por, unevn stn, VSSFO, md fluor, no odr. w/Chrt , & Clystns aa.

7 Dol, lt gy-crm, v. fn-suc, chlky, p intr-xln por, dull min fluor, no stn, w/Ls, lt tn-gy, fn-md xln, gran, chlky, p intr-xln por, no stn, no fluor: Sh's, blk, carb, dk-ltgy, md grn-gy.no odr, NS.

8 Dol, lt tn-gy, fn-suc-chlky, p intr-xln por ,no stn, no fluor, Dol, wht-lt gy, md suc, trs embdd clr sd grns, chlky, p intr-xln por, no stn, no fluor. Tr Dol, lt grn-brn mottld, md suc, scat brn flky stn, NSFO, no odr. Ls, crm-wht, fn-xln , chlky, no vis por, no stn, no fluor, NS.

HW: 376u, C1: NA
2nd FORMATION GAS KICK:
Lags to 5336':
HW: 242u, C1: NA

MUD-CO at 5336': VIS 48, WT 9.4, WL 9.6, LCM 3#, CHL 10,000 PPM

St. LOUIS GAS KICK:
Lags to 5363':
HW: 138u, C1: NA

DST #4: 5,346'- 5,382'
ST. LOUIS

5" - 30" - 45" - 90"
IF: Strong blow off B.O.B. in 10 secs
ISI: GTS in 4 mins. Weak blow back 1/4"
FF: Strong blow (See Flow Chart Below) ,
FSI: Weak blow 1/2 - 2"

RECOVERED
80' TOTAL FLUID

80' GOCM (33%-G, 30%-O, 37% M)
Clean Oil on Top of Tool

IFP: 46 - 37# / 39 - 65#
SIP: 1528 - 1528#

Temp: 112 Degrees F.

DST #4: Final Flow Chart

Min	PSIG	Orif	Field MCFG	Atmos
10	11	1/4"	38	40
20	13	1/4"	41	43
30	13	1/4"	41	43
40	14	1/4"	42	45
45	14	1/4"	42	45

Gas burned rich yellow-blue flame

MUD-CO at 5382': VIS 68, WT 9.4, WL 10.4, LCM 3#, CHL 13,000 PPM

DOLOMITE STRINGER GAS KICK:
Lags to 5434':
HW: 143u, C1: NA

At 5467': VIS 56, WT 9.3, LCM 4#

T/SPERGEN FM GAS KICK:
Lags to 5478':
HW: 62u, C1: NA

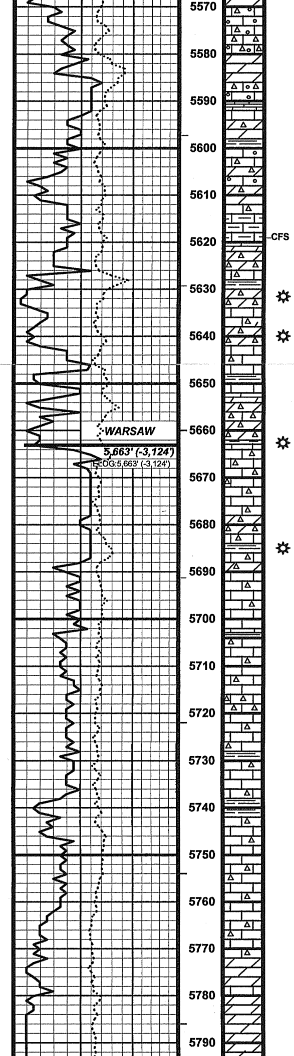
SPERGEN FM GAS KICK:
Lags to 5493':
HW: 110u, C1: NA

SPERGEN FM GAS KICK:
Lags to 5503':
HW: 35u, C1: NA

SPERGEN FM GAS KICK:
Lags to 5529':
HW: 25u, C1: NA

At 5534': VIS 45, WT 9.2, LCM 2.5#

SPERGEN FM GAS KICK:
Lags to 5541':
HW: 49u, C1: NA



Fld Ls, lt tn-gy to crm, fn-md xln, sb gran-ool, embdd dk tn grains,
chlky in prt, rouch surf, p intr-xln/gran por, no stn, no fluor, no odr,
NS, w/Chrt, wht, tn, crm opq.w/sm Chlk, wht.

9

Ls, crm-tn, fn-md xln, gran-sli foss, arg, chlky in prt, no stn, no fluor,
w/Chrt, wht, tn, opq, tn,crm,trnslt-opq, shrp,no fluor,no odr, NS. Tr's
0 Dol, lt gy-crm, v.fn suc, limy, no vis por, no stn, no fluor. NS.

Dol, tn, fn-suc, chlky in prt, gran texture, sli (faintly) foss, embdd
1 w/sd/foss mat, p intr-xln por, no stn, no fluor; Ls tn, fn-md xln, gran, sli
foss, p intr-xln por, no stn, no fluor, w/Chrt, gy, wht, crm, tn, shrp,
opq.no odr,NS. Much Clystns, lt-dk grn gy.

At 5597': VIS 50, WT 9.3, LCM 2#

19 Fld Ls, tn, ool: ooid's/scallops in v. fn-xln matrix, p to no vis por, no
fluor, no stn, intrbdd Dol, tn, v.fn suc, rough -grainy surf textr, sli foss,
embdd rdd dk-tn ls grns, p-fr intr-xln por, no stn, no fluor ,no odr, w/Trs
20" Chrt, wht, tn, crm, trans to opq, blkcy to shrp. NS.
W/depth: same kind of lithology w/inc chlkiness, and occurance of
40" chlk, wht.

MUD-CO at 5611': VIS 49, WT 9.4, WL 9.2, LCM 3#, CHL 12,000 PPM

4

Fld Dol, tn, v. fn-xln, hd, sb-gran, grainy, w/dk gy carb inclns, sm: faintly
foss; Sev: scat p-fr ppt-vug por, no stn, no fluor,w/Ls, congl, gran in fn-
md xln matrx, p intr-xln por, chlky, no stn, no fluor, no odr, NS. w/Much
5 Chrt, lt gy mottld tn-brn, spkled, opq, blcky.

SPERGEN FM/SHALE GAS KICK:
Lags to 5632':
HW: 102u, C1: NA

Fld Dol tn, fn-md suc, p-intr-xln por, Num: mottld gy-dk gy, scat p-fr
ppt and iso vug por, Sm: foss, no stn, no fluor; Ls, tn-gy mottld, gran,
foss, rough surf textr, no stn, no fluor, no odr, NS w/ Chrt, wht, opq,
blcky, gy-brn mottld wht, trns-opq, blcky. Separated by Clystns, brn, lt
grn-gy, dk gy.
6

SPERGEN FM GAS KICK:
Lags to 5640':
HW: 69u, C1: NA

Dol tn, fn-md suc, p-intr-xln por, Num: mottld gy-dk gy, scat p-fr ppt
and iso vug por, Sm; foss, no stn, no fluor; Ls, tn-gy mottld, gran,
foss, rough surf textr, no stn, no fluor, no odr, NS w/ Chrt, wht, blu-
wht, opq, blcky, gy-brn mottld wht, trns-opq, blcky. Separated by
7 Clystns, brn, lt grn-gy, dk gy.

At 5660': VIS 46, WT 9.3, LCM 2#

Dol, tn, v. fn-fn suc, p-intr-xln por, limy, dse, hd, spkld gy, chrty, no
stn, no fluor; Ls, tn, embdd gy gran, foss, rough surf textr, no stn, no
fluor; Chrt, opq, blocky: blk, wht, wht mottld brn, w/ trnslnt, shrp:
8 smoke, crm, tn.

WARSAW SHALE GAS KICK:
Lags to 5663':
HW: 51u, C1: NA

Dol, tn, crm, v. fn-fn suc, p-intr-xln por, limy, dse, hd, spkld gy, chrty,
no stn, no fluor; Dol, crm-lt gy, fn-suc, dse, spkld, hd, chlky in prt, no
vis por, no stn, no fluor, w/Ls, tn, embdd gy gran, foss, rough surf
9 textr, no stn, no fluor; Chrt, wht-mottld brn, gy, blcky,

SHARLE GAS KICK:
Lags to 5686':
HW: 26u, C1: NA

Fld, Ls, crm, sb-gran surf, platey, faintly foss, arg, sli chlky, p intr-xln
por, no fluor, no stn, iso glauc spks, NS. w/ Chrt, trnsl: wht-smoke
0 gry, spkld, blcky. w/Tr Clystns, lt gy, grn-gy,

At 5691': VIS 51, WT 9.3, LCM 3#

Ls, crm, sb-gran surf, platey, faintly foss, arg, sli chlky, scat carb part,
p intr-xln por, no fluor, no stn,; Ls, crm-tn, fn-xln por, no vis por, no
1 stn, no fluor, NS. w/ Chrt, trnsl: wht-smoke gry, spkld, blcky. w/Tr
Clystns, lt gy, grn-gy.

Ls, crm, sb-gran surf, platey, faintly foss, v. chlky, scat carb part, p
intr-xln por, no fluor, no stn; Inc Chlk, wht; Inc Chrt, mottld varieties:
wht, tn, clr, brn, transl, shrp. Inc Sh, blk, carb,
2

Ls, crm, sb-gran surf, platey, faintly foss, v. chlky, scat carb part, p
intr-xln por, no fluor, no stn; Ls, tn, crypto-xln, conchodl, no vis por, no
3 stn, no fluor; Chlk, wht; Inc Chrt, mottld varieties: wht, tn, clr, brn,
transl, shrp. Inc Sh, blk, carb, NS

Ls, crm, sb-gran surf, platey, faintly foss, v. chlky, scat carb part, p
intr-xln por, no fluor, no stn; Tr's Sh, blk, carb: Clystns, brn, lt-grn gy-
4 dk gy. Chrt, mottld varieties: wht, tn, clr, brn, transl, shrp

Fld Sh, blk, carb, Cystn, dk - lt gy, grn-gy w/carb lam, Ls, crm-tn,
5 platey, sb-gran, chlky, p intr-xln por, no fluor, no odr, NS.Chrt, wht-blu-
gy, shrp, trnsl.

Sh, blk, carb, Cystn, dk - lt gy, grn-gy w/carb lam; Chrt, wht-blu-gy,
shrp, trnsl. Ls, crm-tn, wht, platey, arg, sb-gran, embdd rdd foss
6 frags, chlky, p intr-xln por, no fluor, no odr, NS.

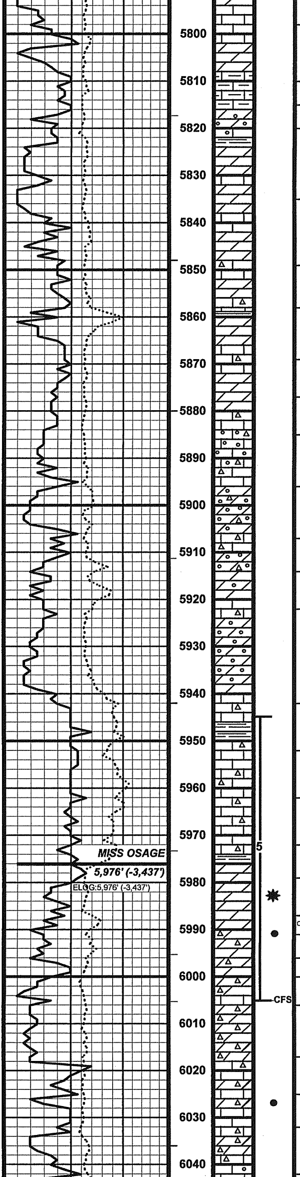
Much Sh, blk, carb, Cystn, dk - lt gy, grn-gy w/carb lam; Sh, brn, gy,
7 hrd, Chrt, wht, lt gy spkld, Tr Dol, tn, md-suc, scat p ppt por, no stn,
no fluor, no odr, NS.

At 5754': VIS 53, WT 9.5, LCM 2#

8 Ls, crm-tn, platey, sb-gran, chlky, p intr-xln por, no fluor, no odr,w/ Sh's
9 and Chrts aa. W/depth, sig inc in Chlk, wht, Tr Dol, tn. Md-suc, no vis
por, no stn, no fluor, no odr, NS.

Ls, crm, fn-xln , no vis por, no stn; Ls, tn-gy, fn-md xln, chlky, foss, no
vis por, no stn, w/Chrt crm, gy, mottled with, spickls /inclusions, opq,
0 blcky. Tr's Dol, v. fn suc, dse, chlky, p intr-xln por, no stn, no fluor, no
odr, NS.

Fld Dol, tn, fn-md suc, p-fr intr-xln por, scat p-fr ppt, iso gd vug
dissolutn por, granulr surf, no fluor, no stn; Dol, lt gy-crm, v. fn-suc,
hrd, dse, no vis por, no stn, no odr, NS.



1 Fld Dol, tn mottld gy, fn-md suc, p-fr intr-xln por, scat p-fr ppt, iso gd
vug dissolutn por, granulr surf, no fluor, no stn; Dol, lt gy-crm, v. fn-
suc, hrd, dse, no vis por, no stn,; Sm Ls, crm-gy, fn-xln, chlky, p por,
no stn, no odr, NS. Sm Chlk, wht.

2 Dol, aa with inc Sh, blk, cark sli fissle, coaly; Dol, lt-md gy, v. fn xln, hrd,
3 chlky, fr-gd dissolutn por, iso gd vug por, no stn , no fluor, no odrf,
NS.w/Much Chlk, wht.
4 Ls, wht, sb-gran, faintly ool, granulr surf in fn-xln matrx, tt, p intr-xln por,
no stn, med wht min fluor; Dol, tn-lt gy, fn-md, scat p-fr dissolutn por, no
stn, no fluor, no odr, NS. Sm Chlk, wht.

Dol, tn, fn-md suc, p-fr intr-xln por, scat p-fr ppt, iso gd vug dissolutn
por, foss cast por, granulr surf, no fluor, no stn; Ls, tn mottld gy, fn-xln,
platey, sm:grainy, arg, chlky, p intr-xln por, no stn, Much Chlk, wht, no
5 fluor, NS.

Fld Dol, tn mottld gy, fn-md suc, p-fr intr-xln por, scat p-fr ppt, iso gd
vug dissolutn por, granulr surf, no fluor, no stn;intr-layrd w/Ls, crm, fn-
xln, gran, platey, p intr-lxn por, no stn, no fluor, no odr, NS.

6
Ls, tn mottld gy, fn-xln, platey, sm:grainy, arg, chlky, p intr-xln por, no
stn, no fluor; Dol, tn mottld gy, fn-md suc, p-fr intr-xln por, scat p-fr
ppt, iso gd vug dissolutn por, granulr surf, no fluor, no stn, no fluor, ;
7 Chrt, tn, shrp, opq-translt.
Fld Dol, tn-gy, fn-md suc, chlky, p-fr intr-xln por, scat p-fr ppt, iso gd
vug dissolutn por, granulr surf, no fluor, no stn;intr-layrd w/Ls, crm, fn-
xln, gran, platey, chlky, p intr-lxn por, no stn, no fluor, no odr,
8 NS.Clystn: blk, carb, hrd, way, w/ dk-md gy, lt grn-gy.
Dol, tn mottld gy, fn-md suc, p-fr intr-xln por, scat p-fr ppt, iso gd vug
dissolutn por, granulr surf, chlky, no fluor, no stn;intr-layrd Ls, crm, fn-
9 xln, gran, platey, p intr-lxn por, no stn, no fluor, no odr, NS.

Dol-Ls, lt crm mottld grn-gy, v.fn. suc, limey, chlky, no vis por, to scat p-
0 fr ppt, iso gd vug dissolutn por, no stn, no fluor, Tr's Crt, lt tn, tn, opq,
shrp, no odr, NS.
Ls, crm-lt gy, wht, fn-md xln, sb-granstn, chlky, p intr-grn/xln por, no stn,
no fluor, Mny pcs: inclded w/md-dk gry phosph nodules / partings; Mny:
1 dolo, w/scat p-fr ppt por: tr's Sh, blk, carb, Claystns, dk gy, w/chrt, tn-
crm, trnsl-opq, blcky-shrp. no odr, NS.
Fld Dol, crm-lt gy mottld dk gy, v.fn-fn suc, chlky, incldéd w/md-dk gry
phosph nodules / partings, sb-gran, no vis por to p -fr intr-xln por, no
stn, no fluor, w/Dol, lt gy, v.fn-suc, tt, p to no vis por, hrd, no stn, no
2 fluor, no odr, NS. Tr's Chrt, wht, tn, crm, trnsl-opq, blcky.
Dol, crm-lt gy mottld dk gy, v.fn-fn suc, chlky, incldéd w/md-dk gry
phosph nodules / prtings, sb-gran, no vis por to p -fr intr-xln por, no stn,
3 no fluor, intr-lyrd w/Chrt, wht, blcky, opq. Sh, blk, carb, Clystn, dk-md
gy, grn-gy.
Dol, crm-lt gy mottld dk gy, v.fn-fn suc, chlky, incldéd w/md-dk gry
4 phosph nods/prtings, sb-gran, inc grn glauc, no vis por to p -fr intr-xln
por, iso ppt por, tr foss cast por, no stn, no fluor; Clystns aa.

Fld Dol, dk-md gy motld tn, gran, v.fn-fn suc, chlky, incldéd w/md-dk gry
phosph nods/prtings, sb-gran, inc grn glauc, no vis por to p -fr intr-xln
por, iso ppt por, tr foss cast por, no stn, no fluor; Clystns, blk, carb, dk -
gy, grn, hrd, waxy;Chrt, dk-lt gy mottld wht; Chlk, wht.

5
Much Clystn, md-dk gy, hrd, dolo; Sh, blk, carb, fiss; Dol, md gy, v.fn-
suc, foss casts, no vis por, no stn, no fluor; Dol, dk-md gy mottld tn,
6 gran, v.fn-fn suc, chlky, incldéd w/md-dk gry phosph nods/prtings, sb-
gran,aa.
Much Clystn, md-dk gy, hrd, dolo; Sh, blk, carb, fiss; ; Dol, md-dk gy, fn-
suc, chlky, carb, no vis por, no stn, no fluor; Dol, dk-md gy motld tn,
gran, v.fn-fn suc, chlky, incldéd dk gry nods/prtings, sb-gran, no vis por
7 tr iso ppt por, no stn, no fluor, no odr, NS.

Abdt Clystns, Blk, carb, fiss, dk-md gy, grn-gy: Dol, md-dk gy, fn-suc,
8 chlky, carb, no vis por, no stn, no fluor; Ls, bf-tn, v.fn-xln, chlky, p intr-
xln por, no stn, no fluor, no odr, NS.
Fld Ls, wht, crm mottld gy, md-xln, dolo betgween sb-grns, incld w/dk
9 gy nods/partgs, grn galcu spts, no vis por, no stn, no fluor, no odr,
NS.
Dol, wht-crm, fn-suc, gran surf textr, p-fr intr-xln por, scat iso p to iso
0 fr ppt, por, unevn stn,patchy gldn fluor, GSFO (live lt brn) , SSG.. At
the base of this intrvl: Dol, wht-crm, v.fn-suc, tt, p intr-xln por, lt unevn-
O6-15" no stn, micro-bds rel when brkn, brt gldn fluor,
30" Dol-Ls, crm, fn-md suc, tt,p intr-xln por,unevn stn,chlky, patchy
fluor,intrbdd Chrt,wht,clr-trnslnt,opq-crm,tn,blcky/shrp.g.odr, SSFO
45" Dol,wht-lt gy,v.fn-suc,chlk,p intr-ln por, uneven stn,no stn, sptty brt
fluor,faint odr,VSSFO;Mst:Fld Dol,crm,fn-suc, tt,cln,p por,no fluor.
60" Sig inc Chrt, wht, clr intrbdd w/Dol, crm, md-suc, no stn.Free Chrt:clr, wht
trnslt, wht mottld tn, shrp-trnslnt, Sh.blk, carb, Clystn:grn-gy.

Chrt, clr, wht trnslt, wht mottld gy, tn, shrp-trnslnt/opq,spkld, intrlyrd
w/Dol, crm, wht, wht mottld gy, fn-md suc, p intr-xln por, tt, sm scat p
3 ppt por, sm p foss cast por, no fluor, no odr, NS.
Ls, wht, crm, dolo, fn-md xln, gran-platey, faintly foss in prt, p intr-xln &
scat p ppt por, no stn, no fluor;Dol, crm, wht, wht mottld gy, fn-md suc,
4 p intr-xln por, tt, sm scat p ppt por, no fluor, no odr, NS.
Ls, wht, crm, dolo, fn-md xln, gran-platey, faintly foss in prt, p intr-xln &
5 scat p ppt por, no stn, no fluor;Tr Dol, wht-mottld brn (stn), fn-suc,tt,lt
unevn stn,patchy gldn fluor,VSSFO; Much Chrt, clr, wht, gy.
Ls, wht, crm,fn-md xln, gran-platey, faintly foss, p intr-xln, no stn, p
fluor; Dol, crm, wht, wht mottld gy, fn-md suc, p intr-xln por, tt, sm scat
p ppt por, sm p foss cast por, no fluor; intrlyrd Chrt, clr, wht trnslt, wht
6 mottld gy, tn, shrp-trnsl opq. Inc Clystns, dk-lt gy, Sh, blk.

At 5848': VIS 60, WT 9.4, LCM 2#

At 5942': VIS 52, WT 9.5, LCM 2#

DST #5: 5,945'- 6,005'
MISS. OSAGE

5" - 30" - 10" - 30"
IF: Weak 1/2" blow .
ISI: No return blow
FF: No blow, FSI: No return blow

RECOVERED
20' TOTAL FLUID

20' Mud (100% M)

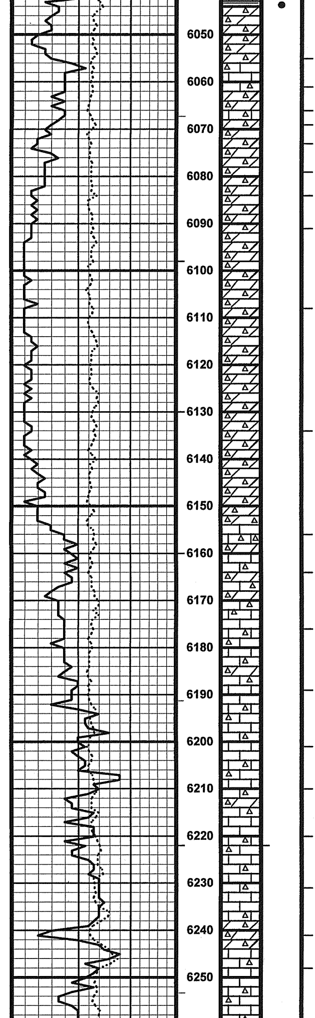
IFP: 44 - 48# / 49 - 55#
SIP: 1952 - 1903#

Temp: 121 Degrees F.

MISS OSAGE GAS KICK:
Lags to 5983':
HW: 36u, C1: NA

MUD-CO at 6005': VIS 75, WT 9.5, WL 11.0,
LCM 3#, CHL 8,500 PPM

At 6030': VIS 60, WT 9.3, LCM 1.5#



Tr Dol, wht-mottld brn (stn), fn-suc,tt,lt unevn stn,patchy gldn fluor,
VSSFO;Ls, crm-lt gy, fn-xln, platey, tt, p intr-xln por, no stn, no fluor,:
Dol, wht, crm, fn-md suc, chlky, p por, no sth, no fluor; w/Chrt, aa.

7 Sh, blk carb, hrd, sil, w/Clystns, md-dk gy, brn-gy, blk carb lam; Chrt,
wht mottld crm, opq, grainy, lt gy mottld dk gy, opq, blcky, opq, blcky,
8 blk-shrp,tn,crm:opq-trnsl; Ls,wht,crm,fn-md xln,gran-platey, chlky, p intr-
xln, no stn, p fluor; Dol, crm, wht, fn-md suc, p intr-xln por, tt, sm scat p
9 ppt por, sm p foss cast por, no fluor; no odr, NS.

0 Inc Chrt, wht, clr, crm, tn, opq, blcky, gy mottld wht, foss, opq, blcky
1 crm, tn, trnsl, shrp, w/Dol, crm-wht, fn-md suc, p-fr intr-xln por, iso fr-gd
ppt/vug por, no stn, no fluor, no odr, NS. Chlkier w/depth.

Chrt, wht, clr, crm, tn, opq, blcky, gy mottld wht, foss, opq, blcky crm,
2 tn, trnsl, shrp, w/Dol, crm-wht, fn-md suc, chlky, p-fr intr-xln por, iso fr-
3 gd ppt/vug por, no stn, no fluor, no odr, NS. Chlk, wht.

Mostly Chrt, wht, clr, crm, tn, opq, blcky, gy mottld wht, foss, grainy,
opq, blcky crm, tn, trnsl, shrp; Chrt, clr, cse ang, grn clstrs, sli calc cmt
4 w/Dol, crm-wht, fn-md suc, chlky, p-fr intr-xln por, iso fr-gd ppt/vug por,
no stn, no fluor, no odr, NS.

Chrt, wht, clr, crm, tn, opq, blcky, gy mottld wht, foss, grainy, opq,
blcky crm, tn, trnsl, shrp; Chrt, clr-wht, trnsl, cse ang, grn clstrs, sli
calc cmt; Chrt, wht, tripolitic, foss, p por, no fluor, Sm: Dol, wht-crm,
fn-md xln, p intr-xln por, iso dissolution por, vugs, no stn, no fluor, no
5 odr, NS.

At 6100': VIS 50, WT 9.5, LCM 1.5#

Chrt, wht, clr, crm, tn, opq, blcky, gy mottld wht, foss, grainy, opq,
blcky crm, tn, trnsl, shrp; Chrt, clr-wht, trnsl, cse ang, grn clstrs, sli
calc cmt; Chrt, wht, tripolitic, foss, p por, no fluor, Sm: Dol, wht-crm,
fn-md xln, chlky in prt, p intr-xln por, iso p-fr dissolution por, few p.
vugs, no stn, no fluor; Chlk, wht, no odr, NS.

6

Chrt, wht, clr, crm, tn, opq, blcky, gy mottld wht, foss, grainy, opq,
blcky crm, tn, trnsl, shrp; Chrt, clr-wht, trnsl, cse ang, grn clstrs, sli
calc cmt; Chrt, wht, tripolitic, foss, p por, no fluor, Sm: Dol, wht-crm,
fn-md xln, chlky in prt, p intr-xln por, iso p-fr dissolution por, few p.
vugs, no stn, no fluor; Chlk, wht, no odr, NS.

D&C Pits 1,2,3 & 4 Added Pre-Mix

7

Most Chrt, md gy mottld lt gy/wht, wht, frstd-wht, crm tn, opq, blocky,
no por, w/Chrt, wht, sli-trip, grainy, opq, no stn, w/intrlyrd Dol, crm, fn-
8 md suc, chlky in prt, p intr-xln, no stn; Ls, wht-crm, fn-xln, chlky, no
vis por, no stn, no fluor, no odr, NS.

MUD-CO at 6161': VIS 59, WT 9.6, WL 9.8,
LCM 3#, CHL 10,000 PPM

Dol, crm, fn-md suc, chlky in prt, p intr-xln, no stn; w/intrlyrd Chrt, md
gy mottld lt gy/wht, wht, crm tn, opq, blocky, no por, no stn, w/ Ls, wht-
9 crm mottld lt gy, fn-xln, chlky, no vis por, no stn, no fluor, no odr, NS.

Fld Chlk, wht, hd, w/Ls, lt gy-crm, crypto-xln, platey, faintly sb-gran,
no vis por, no stn, mod dull min fluor, Sm Dol, lt gy-crm, crypto-xln,
no vis por, no stn, w/intrlyrd Chrt, md gy mottld lt gy/wht, wht, crm,
0 opq, blocky, no por, no stn, no fluor, no odr, NS.

Fld Dol, lt gy-tintd grn, sli limey, hd, no vis por, no stn, no fluor;
w/Much Chrt, clr, wht, lt gy, crm, tn, opq-trnsl, blcky; Dol, crm-tn, v.fn
suc, tt, no vis por, no stn, no fluor. Much Chlk, wht. Tr's Sh, blk, carb
1 and Clystns, dk-med gy.

Sig inc Sh, blk, carb and Clystns, dk-med gy. w/ Dol, lt gy-tintd grn, sli
limey, hd, no vis por, no stn, no fluor; w/Much Chrt, clr, wht, lt gy, crm,
tn, opq-trnsl, blcky;Chlk, wht. Tr's Ls, crm, fn-xln to chlky, no vis por
2 no stn, no fluor, no odr, NS.

At 6204': VIS 46, WT 9.4, LCM 2#

Ls, crm, fn-xln to chlky, platey, arg, no vis por no stn, no fluor; Dol, lt
gy-tintd grn, sli limey, hd, no vis por, no stn, no fluor; w/Chrt, clr, wht,
3 lt gy, crm, tn, opq-trnsl, blcky; Chlk, wht. Sh, blk, carb and Clystns, dk-
md gy, no odr, NS.

Ls, crm-gy, tintd grn, crm, v. fn-xln, platey, chlky in prt, no vis por, no
stn, no fluor; Dol, crm-gy tintd grn, fn suc, grainy surf textr, sli chlky, no
vis por, no stn, no fluor; w/Chrt, clr, wht, lt gy, crm, tn, opq-trnsl, blcky,
4 Sh, blk, carb and Clystns, dk-med gy, no odr, NS.

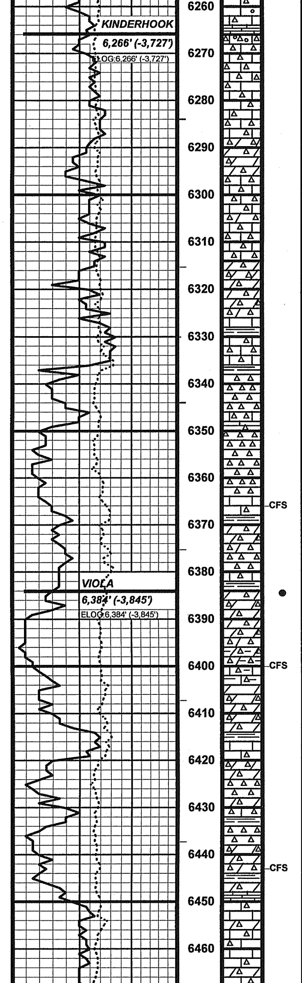
At 6222': VIS 46, WT 9.4, LCM 2#

Fld Dol, tn, v. fn suc, hrd, homogenous, p intr-xln por, no stn, no fluor
w/Tr Dol, crm, md-suc, micro foss w/much gd dissolution ppt and intr-
5 gran por, no stn, no fluor, no odr, NS.

Dol, tn, v. fn suc, hrd, homogenous, p intr-xln por, no stn, no fluor; Ls,
6 gy-tn, crypto-xln, platey, no vis por, no stn no fluor intrlyrd w/Chlk,crm,
wht; Chrt, tn, crm, wht-gy, mottld, shrp, opq.blcky-shrp.

Chrt, gy mottld wht, foss/ls congl, no por; Chrt, clr, crm, trnsl, shrp; wht-
blu-gy, shrp, opq;tn, crm foss, no por, opq, shrp. Ls, gy-crm, brt grn
moss, crypto-xln, no por, no stn, no fluor, ; Ls, crm-gy, fn-xln, platey, no
7 vis por, no stn, w/Clystns, grn-gy, gy, Tr Sh, blk, carb.

At 6252': VIS 52, WT 9.3, LCM 4#



KINDERHOOK: Ls, dk gy-brn, tn, mottled lt gy, crypto-xln, foss, sb-
gran, no stn, no fluor; Ls, blk, brn, chlky, fn-xln, no por, no stn, no fluor;
8 Chrt, blk-brn-blu-trnslt, dk gy shrp; Ls crm mottled dk gy incldd. w/Sm
chlk, wht. No odr, NS.
Much Ls, dk gy-brn, tn, mottled lt gy, crypto-xln, foss, sb-gran, no stn,
no fluor; Much Chrt, blk-brn-blu-trnslt, dk gy, brn, trnslt, shrp-blcky,
conchdl; no odr, no fluor, NS.

9

Ls, dk gy-brn, tn, mottled lt gy, crypto-xln, foss, carb prtgs, no stn, no
0 fluor; Much Chrt, blk-brn-blu-trnslt, dk gy, brn, trnslt, shrp-blcky,
conchdl; Chlk, wht, Ls, tn-brn, fn-xln, no por, no odr, no fluor, NS.
Dol, gy-tn, fn-suc, limey, p. intr-xln por, no stn, intrbdd Ls, crm, fn-xln,
p por, no stn;Abdt Chrt, blk-brn-blu-trnslt, dk gy, brn, trnslt, shrp-
blcky, conchdl; Ls, brn-gy, crypto-xln, conchdl, no vis por, no stn, no
1 fluor, no odr, NS.
Much Chrt, lt gy, grainy, blcky, opq. Chrt, blk-brn-blu-trnslt, dk gy, brn,
tn mottled crm, spkld, trnslt, shrp-blcky, conchdl; Dol, crm, fn-suc,
dull, no vis por, no fluor, no stn'; Ls, brn, crypto-xln, no vis por, no stn,
2 no fluor, no odr, NS.
Chrt, lt gy, grainy, blcky, opq. Chrt, blk-brn-blu-trnslt, dk gy, brn, tn
mottled crm, spkld, trnslt, shrp-blcky, conchdl; Dol, crm, fn-suc, fn-
suc, tt, dull, no vis por, no fluor, no stn'; Ls, brn, crypto-xln, no vis por,
no stn, no fluor, no odr, NS.

3

Fld Ls, crm, crypto-xln to md xln, arg, foss casts, p intr-xln por, no stn,
no fluor; Dol tn-lt gy, fn-suc, tt, p intr-ln por, no stn, no fluor; Chrt, brn-
4 blu-trnslt, dk gy, brn, tn mottled crm, spkld, trnslt, shrp-blcky, conchdl,
no odr, NS. At base of interval: Clystn, grn-gy, dk gy: hrd, wxy.

5

Fld Chrt, vanilla, sli grainy, opq, inclusions, shrp,Chrt, wht sli spkld, opq,
6 shrp; Chrt, lt crm-gy, grainy, opq, shrp; Chrt, clr-lt tn, trnslnt, Sh, blk,
66 carb, hrd wxy; Chrt, crm, grainy, v. sli dolo, no tn, no fluor, Mdstn, lt tn,
fn-ln, chlky, no vis por, no stn; Trs Dol, crm, md suc, tt, p intr-ln por, no
15" stn, no fluor, no fluor, no odr NS
30" Chrt aa. Sm: Ls, lt crm-gy, crypto-ln, no vis por, no stn, no fluor, no odr NS.
Fld Chrt, crm, grainy, sli dolo, p-fr intr-xln por, iso p-fr ppt por, sm: faces
45" dissltn fr-gd ppt/sli vug, no stn, no fluor; Chrt, vanilla mottld lt gy-blu,
shrp, opq; trs Chrt, brn -clr, opq-trnslnt, shrp.Tr's Ls, tn-brn,crypto-xln,
platey, lt-dk gy inclusions, no vis por, no stn, no fluor, no odr, NS.

60"

Sm Clystns, lt grn--gy.Ls, gy-tn, fn-xln, clky, p intr-xln por, sm spkld
9 phos nods,no stn, no fluor;Chrt, crm, grny, sli dolo, p-fr intr-xln por, iso p-
0 fr ppt por,sm:faces dissltn fr-gd ppt/sli vug,no stn,no fluor;NS
Dol, lt tn, fn-suc, p intr-xln por,sm: scat p-fr ppt dissln por, tr foss
15" casts, no stn, Chrt, lt crm-gy,mottld grny,opq,shrp,Chrt, wht- lt blu
30" mottld dk gy inclns, opq, shrp-blcky. Chrt, brn, shrp; Clystns, grn, grn-
VIOLA: Tr Dol, lt crm-gy, fn-suc, grnlr surf, p intr-xln por, ptchy dull
45" gldn fluor, rel v.lt oil whn brkn, live & flky. v. sli odr; Most: Dol, lt tn, fn-
suc, p intr-ln por, scat p ppt por, chlky, no stn, no fluor, no odr, NS.
W/Depth: Dol, aa, Much Chlk, wht. At Base:Dol aa , chlky, p intr-ln
por, no flour, no stn, no odr, NS. W/ Chrt: lt crm-gy, mottld, grny, opq,
60" shrp; Chrt, wht-lt blu mottld dk gy inclns, opq, shrp-blcky. Chrt, brn,
75" shrp. No odr, NS.
Dol, crm-lt tn, fn-suc, p intr-xln por, no stn, no fluor, chlky in prt ,Sm pcs:
xl ovrgrwths, fr to iso gd intr-xln por, no stn

2

Fld, Dol, crm-wht, v.fn suc, tt, no stn, dull min fluor; Dol, crm-wht, md-
suc, gran surf, p to iso fr ppt por, no stn, NS; Chrt, lt crm-gy, mottled,
3 grainy, brn, wht, blu-gy, opq, shrp, no dor, NS.
Sh, blk, carb;Ls, tn, fn-xln,no vis por, no stn, no fluor;Chrt:hrt, lt crm-gy, mttld,
4 grny, opq, shrp, no odr, NS
15" Dol, lt tn, fn-suc, p intr-xln por, scat p ppt por, chlky, no stn, no fluor; Sm edg
dissln por: gd pp por, no stn, no fluor, Ls, tn, fn-xln,no vis por, no stn, no fluor,NS
Abdt Chrt, vnlla mottld lt gy-blu,tn, brn-clr, shrp,opq-trnslt, Dol, lt tn-wht,
30" fn-suc, p intr-xln por, scat p ppt por, chlky, no stn, no fluor; Sm pcs: iso
p -fr scat pp por, no stn, no fluor, NS.
45" Abdt Chrt, vnlla, mottld lt gy in prt, shrp, opq; trs Chrt, tn, brn -clr, opq-
trnslnt, shrp; Dol, lt tn-wht, fn-suc, p intr-xln por, scat p ppt por, chlky,
no stn, no fluor; Sm pcs: iso p -fr scat pp por, no stn, no fluor, no odr,
60" NS.
Dol, crm, fn-md suc, grainy, p intr-ln por, Sm: v.fn-md suc, iso p-fr ppt
6 por, no stn, no fluor; Chrt, vanilla mottld lt gy, shrp ang, opq; Tr
Clystn, dk grn, waxy.
Ls, crm-wht, fn-xln, platey, p intr-ln por, tt, chlky, no stn, no fluor. Dol,
crm, fn-md suc, grainy, p intr-ln por, Sm: v.fn-md suc, iso p-fr ppt por,
7 no stn, no fluor; Chrt, vanilla mottld lt gy, shrp ang, opq;
Ls, crm-wht, fn-xln, platey, p intr-ln por, tt, chlky, no stn, no fluor. Dol,
crm, fn-md suc, grainy, p intr-ln por, Sm: v.fn-md suc, iso p-fr ppt por,
8 no stn, no fluor; Chrt, vanilla mottld lt gy, shrp ang, opq;

The Kinderhook and Viola picks are based off correlations to the Big X #1 Taylor Arbuckle test well drilled in Sec. 21-30S-23W to the south, as the only reliable data reference in this area for this depth .

At 6315': VIS 54, WT 9.2, LCM 6#

No HW Gas Kick

At 6315': VIS 54, WT 9.2, LCM 6#

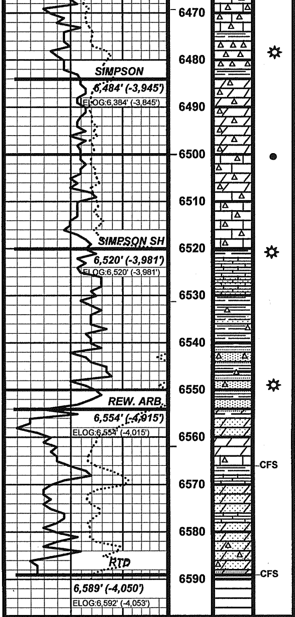
No HW Gas Kick

At 6366': VIS 48, WT 9.1, LCM 5#

VIOLA GAS KICK:
Lags to 6390':
HW: 11u, C1: NA

MUD-CO at 6400': VIS 54, WT 9.2, WL 9.0,
LCM 5#, CHL 4,800 PPM

At 6437': VIS 53, WT 9.2, LCM 5#



Ls, crm, crypto-xln, v. p intr-xln por, no stn, no fluor; Chrt, dk brn intrlyrd wht-opq, shrp-blcky, fluor-copper org; Ls, dk brn, crypto-xln, no vis por, no stn, no fluor; Much Chrt, vanilla mottld lt gy, shrp, ang,
9 opq;

Much Chrt, brn, trnsl-opq, shrp. Tn, wht, crm, fresh, clean, crm, tn. Shrp to blcky. **SIMPSON:** Dol, brn, fn-suc, fri, p to no vis intr-xln por, dull org-copper fluor, no show of live oil or gas.

0

Dol, brn, fn-suc, fri, p to no vis intr-xln por, dull org-copper fluor, no show of live oil or gas .Much Chrt, brn, trnsl-opq, shrp. Tn, wht, crm,
1 fresh, clean, crm, tn. Shrp to blcky.

Ls, crm-lt tn, fn-ln, platey, p intr-ln por, no fluor; Dol, crm-lt gy, tintd grn, fn-suc, chlky, ebdd foss frags in prt, fri, fr intr-xln por, no stn, no fluor, few: rel few microbds whn crshd, few micro droplets oil floatng. Chrt, brn, trnsl-opq, shrp. Tn, wht, crm, fresh, clean, crm, tn. Shrp to blcky.
2 Chlk

Ls, crm-lt gy, sb gran, chlky, p por, no stn intrlrd w/Chrt, wht, tn-brn spkld, clr, crm, trnsl-opq, shrp, Tr's Clystns, pale grn, brn. Much Chlk, wht.

3

Clystn, tourquois, forest grn, Sh, blk, carb, w/Clystn, grn-blk, embdd w/ sd grns, phosphatic nods, w/Chrt, brn-conchdl, tn-spkld, gy, wht,
4 trnslnt, wht-opq. Ls, crm, crypto-xln, embdd w/v. fn snd grns,

Much Clystn, tourquois, forest grn, pale blu-grn, sm:spkld pyr, emdded phosphate nods, Clystns, blk, brn, Tr;'s Sltstn, gy-grn, dolo, clayey,dk gy inclusns, Chrt, lt gy, wht opq, brn-trnsl; Dol, crm, fn-suc,
5 no vis por, no sth, no

6 Fld Qrtz Sd Clstrs, clr, cse grn, md srtd, sb-ang-sb rdd, xl ovrgrths, fr fri,
embdd w/dk gy micro phsphate chps, p-intr-gran por, sli-dolo, no stn, no
66 fluor, no odr, NS. Tr Grainstn, tn, embdd ooids, scallops, in v. fn xln matri, p
15" intr-gran por; Variety Chrt: wht, lt gy: blcky, opq; blu-wht, tn-brn,trnsl-opq,Ls,
crm-lt tn,fn-md xln,grn surf,p intr-xln por no fluor,no odr NS.
30"

ARB: Tr's Dol, crm-brn, fn-md suc, embdd v.fn.grn sd grns, grny-grn
45" surf textr,no fluor,v. hd,p intr-xln por,no stn,Few: brn carb spks (not oil
stn). Tr; Sh, blk, carb, Clystns, blu-grn aa, Ls, crm- lt tn, fn-md xln, sb
60" gran, p intr-xln por, no fluor, no stn, no odr, NS.
Much Clystn, sea grn,pyr;SS clstrs,clr-gy, fn-md grn,md srtd, mod fri,
89 pyr grns embdd,qtz xl ovrgwths, p intr-gran por, no fluor, no stn; Dol,lt tn
to brn,fn-md suc,embdd v.fn.grn sd grns, grny-gran surf textr, no fluor,v
20" hrd, p intr-xln por,no stn,Sm: iso p ppt por, no stn;
Much Dol, crm, lt tn, md-suc, abdt embdd fn-md snd grns, p intr-
40" xln/gran por, no stn, no fluor; Dol, crm to tn, v.fn-suc, hrd, chlky in prt,
no vis por; Dol, tn, v.fn-md suc,hrd, p intr-xln por, scat oom por: p-fr ppt
60" por (Casts of snd grns falling out), no stn, mod dull yel min fluor;Chrt:
wht, lt gy: blcky, opq; tn, trnsl-opq; No odr, NS. Clystn, sea grn.

At 6469': VIS 51, WT 9.0, LCM 4#

BASAL VIOLA GAS KICK:
Lags to 6482':
HW: 28u, C1: NA

At 6515': VIS 57, WT 9.2, LCM 5#

SIMPSON SHALE GAS KICK:
Lags to 6482':
HW: 21u, C1: NA

At 6545': VIS 50, WT 9.3, LCM 5#

SIMPSON SAND GAS KICK:
Lags to 6549':
HW: 21u, C1: NA

No HW Gas Kick

At 6566': VIS 54, WT 9.3, LCM 5#

MUD-CO at 6589': VIS 48, WT 8.9, WL 12.8, LCM 3#, CHL 8,000 PPM

OPERATOR:	**GATEWAY RESOURCES, LLC**	**LOCATION: 1900' FNL & 1631' FWL**	**GEOLOGIST: GARY F. GENSCH**
CONTRACTOR:	**VAL ENERGY RIG #2**	**SECTION 8 TOWNSHIP 30S, RANGE 23W**	**TESTER: TRILOBITE TESTING**
LEASE:	**#1-8 BOWLING**	**COUNTY: CLARK**	**LOGGER: NABORS COMP & PROD.**
ELEVATION:	**KB: 2,539**	**STATE: KANSAS**	**MUD: MUD-CO**
TOTAL DEPTH:	**RTD: 6,589' (-4,050')**	**LTD: 6,592' (- 4,053')**	**API NO. 15-025-21,571-0000**