Geologic Formation	Top	Base
Stanton Ls.	3716	3740
Lansing Group	3740	4140
Kansas City Group	4140	4420
Stark Shale	4420	4450
Hushpuckney Shale	4450	4480
Marmaton Group	4480	4800
Pawnee Ls.	4480	4520
Fort Scott Ls.	4520	4560
Cherokee Shale	4560	4800
Johnson Zone	4600	4800
Morrow Shale	4800	4840
Miss. St. Gen.	4840	4880
Kinderhook Shale	4880	4900
Viola Ls.	4900	4940
Simpson Shale	4940	4980
Arbuckle Ls.	4980	5000

Formation	Top	Base
Heebner	3781	(-884)
Toronto	3798	(-901)
Lansing	3824	(-927)
Muncie Crk.	4034	(-1137)
Stark	4159	(-1262)
Hush.	4204	(-1307)
B/KC	4299	(-1402)
Marmaton	4320	(-1423)
Pawnee	4400	(-1503)
Fort Scott	4425	(-1528)
Cherokee	4441	(-1544)
Johnson	4528	(-1631)
Morrow Sh.	4620	(-1723)
Miss St. G	4828	(-1731)
St. L "B"	4686	(-1789)
St. L "C"		

Rec. 248 GIP
Gas Flow Gas - Grav 31
30 min. 80 MCF
2nd 30 min. 133 MCF
TP 20 PSIG
20 min. 20 MCF
2nd 30 min. 30 MCF
Gas Flow Rate
340 Total Mcf/d

IFP: 27-27/46-45*
FSIP: 1048/45*
IHP: 2135/2135*
FHP: 2135/2135*
Chlorides: 17,000 ppm

KITT NOAH

PETROLEUM GEOLOGIST

Kansas License #229

GEOLOGIST'S REPORT

DRILL STEM TEST REPORT

Operator:	Hartman Oil Co., Inc.
Lease:	Ward Twin
Well No.:	#4
Location:	330FS & 1475FE
Sec.:	16
Twp.:	22S
Rge.:	33W
County:	Finney
State:	Kansas
Elevation:	KB 2897
Date Completed:	2-8-2002
Total Depth:	5000
Contractor:	Duke Drilling Co. Inc. Rig #9
Spud Date:	2-2-2002
Time:	9:45 AM
Surface Csg:	8 5/8" @ 1800'
Production Csg:	5 1/2" @ 4997'
Mud Type:	Chemical
Rotary Time:	24 hrs.
Samples Saved:	Yes
Drill Stem Tests Run:	3
Drill Stem Tests Rec.:	3
Logs Run:	Dual Induction, Compensated Density/Neutron, Sonic, Micro
Remarks:	Ran DST's on Heebner, Lansing, Muncie Creek, Stark, Hushpuckney, B/KC, Marmaton, Pawnee, Fort Scott, Cherokee, Johnson, Morrow, Miss. St. Gen., St. L "B", St. L "C"

Respectfully Submitted,
Kitt Noah
Petroleum Geologist

LEGEND

Limestone, Oolitic Limestone, Dolomite, Sandstone, Shale, Carbonaceous Shale, Chert, Anhydrite

DEPTH — DRILLING TIME IN MINUTES PER FOOT (Rate of penetration increases 5' 10' 15' 20') — SAMPLE DESCRIPTIONS — REMARKS

3700

Sh, lt gry & green

LS,crm fn xln v. fossil pr interport poro NSHO

LS,tan fn xln fossil,oil sol pr-fr interport poro NSHO

LS,crm-tan fn xln fossil,fair oil sol pr-fr interport poro NSHO,sc fun

Sh, gry & green

LS,crm fn xln fossil & ool pr interport poro NSHO

LS,tan xln AA

Heebner — EL 3781 (-884)

3800

Sh, blk carbonaceous

Toronto — EL 3798 (-901)

Sh, gry, green, maroon

LS,crm-wht fn xln oolitic pr-fr interport poro,tan NSHO,sc angular chert

LS,crm AA

Lansing — EL 3824 (-927)

Sh, gry, green, maroon

LS,crm fn xln v. sol pr-fr interport poro,sc barren fossil v. dun wht chalk

LS,crm dense AA

"B"

Sh, lt & dk gry

LS,crm-tan fn xln fossil, sc interport poro NSHO,sc gry angular chert

Sh, lt & dk gry

"C"

LS,crm fn xln v. oolitic pr-fr interport poro NSHO,dun wht chalk

"D"

LS,crm fn xln fossil pr interport poro NSHO

LS,crm fn xln fossil & ool pr-fr interport poro NSHO,sc chert

3900

LS,crm fn xln fossil & ool pr-fr interport poro NSHO,sc wht chert

"E"

LS,crm fn xln pr xln poro dense NSHO,dun wht chert

Sh, blk carbonaceous

LS,crm fn xln fossil pr visible poro NSHO

LS,crm fn xln fossil & ool pr-fr interport poro NSHO,sc dun chert

"F"

LS,crm-tan fn xln fossil & ool fr interport poro barren NSHO,sc chert

LS,crm AA

LS,tan fn xln pr visible poro dense NSHO

"G"

Sh, gry, green, maroon

4000

LS,crm fn xln fossil v. sol pr interport poro,sc barren NSHO

LS,crm occ AA

LS,crm-gry fn xln sil fossil pr interport poro, barren NSHO

LS,tan fn xln pr visible poro; dense NSHO

Muncie Crk. — EL 4034 (-1137)

"H"

Sh, blk carbonaceous

Sh, gry, green, maroon

LS,wht fossil & ool pr-fr interport poro; sev pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; sc gry shale; odor: all yellow fluor; milky cut

"I"

Sh, blk carbonaceous

LS,crm fn xln fossil v. oolitic poro,sc pr-fr interport poro; sev pieces v. coarse sily growth poro; sc dun chert; sc dk brown shale; odor: all yellow fluor; milky cut

LS,crm-tan fn xln sil fossil pr interport poro, dense NSHO

LS,crm-tan fn xln fossil & ool poro; sc dun chert; sc dk brown shale

Wiper Trip at 4036' 40 stands

LS,crm fn xln fossil v. sol pr-fair interport poro; barren NSFO; sc dun chert; sc dk brown shale; odor: yellow fluor; milky cut

LS,crm-wht fn xln fossil v. sol pr interport poro; barren NSFO; sc pungent odor

LS,crm; occ AA

LS,crm-tan fn xln sil fossil pr-visible poro

LS,crm dense AA

Stark — EL 4159 (-1262)

"J"

Sh, blk carbonaceous

LS,crm fn xln fossil v. oolicastic poro; fair oil sol pr-fair interport poro; fair oil sol pr-fair interport poro; sev pieces v. fr oolitic poro; sc dk brown shale; odor: yellow fluor; milky cut

LS,crm-gry fn xln fossil & oolic poro; sc dun chert; sc dk brown shale; odor: all yellow fluor

LS,crm-wht fn xln sil oolitic pr interport poro; dense NSHO

Hush — EL 4204 (-1307)

"K"

Sh, blk carbonaceous

LS,crm fn xln detritial v. fossil pr-fair interport poro; 1-2 pieces dark brown asphaltic poro; sc dun chert; sc dk brown shale; odor: yellow fluor; milky cut

LS,crm fn xln v. fossil & ool; fr-good interport poro; sev pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; odor: yellow fluor; milky cut

LS,crm-tan fn xln v. fossil & ool; fair interport poro; 1-2 pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; odor: yellow fluor; milky cut

LS,crm-wht fn xln sil oolitic pr interport poro; dense NSHO

B/KC — EL 4299 (-1402)

LS,crm-tan fn xln fossil pr visi poro; NSHO

Sh, dk gry & maroon; gummy & tiny

Marmaton — EL 4320 (-1423)

LS,crm fn xln v. sol; subvitreous pr-fr interport poro; rock fragments poro; sc dun chert; sc dk brown shale; sc pale white shale; odor: yellow fluor; milky cut

LS,crm fn xln sil fossil pr interport poro; NSHO

DST #1 (320-1377)
IFP: 20-20/47
No Blowback
2nd Op Dead
Weak Sfc Blowback

Rec.
10 Free Oil - Grav 28
30 MCO (TOC) 37%G
2nd 30 MCO 37%G
TP: 30 PSIG
20 min. 30%G
2nd 30 min. 30%G
IFP: 10-10/46-30*
FFP: 20-17/46/70*
FSIP: 613/46/45*

Alt"B"

LS,crm-tan-brown fn xln mstly oolitic poro; fair oil sol pr-fair interport poro; sev pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; odor: all yellow fluor; milky cut

Sh, gry & maroon

Alt"C"

LS,crm-tan fn xln v. sol; sil fossil pr-fair interport poro; fr pelletal poro; fr pelletal poro; sc dun chert; sc dk brown shale; sc gry shale; odor: yellow fluor; milky cut

Pipe Strap at 4377 3.05 Long to Board

Pawnee — EL 4400 (-1503)

Sh, blk carbonaceous

LS,crm-tan fn xln fossil oolitic; fr-fr interport poro; subchalky poro; sc dun chert; sc dk brown shale; sc gry shale; sc rock chip brown; sc rock chip white; odor: yellow fluor; milky cut

Fort Scott — EL 4425 (-1528)

LS,tan-crm fn xln fossil & oolicastic poro; fair oil sol pr-fair interport poro; sev pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; odor: yellow fluor; no cut

Cherokee — EL 4441 (-1544)

Sh, blk carbonaceous

LS,crm-tan-brown fn xln fossil v. oolicastic poro; fair oil sol pr-fair interport poro; sev pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; odor: all yellow fluor; milky cut

Sh, dk gry & maroon

LS, 1-2 pieces ste AA

Sh, blk carbonaceous

LS,crm fn xln pr-fair interport poro; dense NSHO

LS,crm fn xln sil fossil pr interport poro; NSHO

LS,crm fn xln sil fossil pr interport poro; NSHO

LS, AA

Sh, blk carbonaceous

LS,crm-gry fn xln sil fossil; oil pr interport poro NSHO

Sh, blk carbonaceous

LS,crm-tan fn xln sil fossil pr interport poro; dense NSHO

LS,crm fn xln sil fossil pr interport poro; dense NSHO

LS,crm fn xln sil fossil pr interport poro; dense NSHO

Johnson — EL 4528(-1631)

Sh, gry & green

LS,tan-tan brown fn xln fossil-oolicastic poro; fair oil sol pr-fair interport poro; sc dun chert; sc dk brown shale; sc gray shale; odor: yellow fluor; no cut

LS,crm-tan fn xln fossil & oolicastic poro; fair oil sol pr-fair interport poro; sev pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; odor: yellow fluor; milky cut

LS,crm-tan fn xln fossil & oolicastic poro; fair oil sol pr-fair interport poro; sev pieces v. fr oolitic poro; sc dun chert; sc dk brown shale; odor: yellow fluor; milky cut

Morrow Sh — EL 4620 (-1723)

Sh, bright green & maroon

Miss St. G — EL 4828 (-1731)

LS, ck-fn med gr subround well srt ss; sc dk brown shale; sc gry shale; odor: yellow fluor; milky cut; no cut

Ms,lts,crm-wht fn xln sucr dolomite; sc dk brown shale; sc gry shale; fr odor no cut

LS,crm-wht fn xln fossil pr-fair interport poro; NSHO

Ls,wht fn xln fossil; fair interport poro; NSHO 1 piece dolomitic chert

LS,wht AA; friable NSHO

LS,wht fn xln sucr poro; pr interport poro

LS,crm fn xln v. sol; pelmicrite poorly sorted; fr-fair interport poro; many fossils sparitized; sc dun chert; sc dk brown shale; sc gray shale; odor: v. bright yellow fluor; no cut

St. L "B" — EL 4686 (-1789)

DST #2 (4676-4700)
IFP: 30-30/46-30*
No Blowback
2nd Op Dead
Weak Sfc Blowback

Rec.
248 GIP
Gas Flow Gas - Grav 31
30 min. 80 MCF
2nd 30 min. 133 MCF
TP: 20 PSIG
20 min. 20 MCF
2nd 30 min. 30 MCF
Gas Flow Rate
340 Total Mcf/d

IFP: 27-27/46-45*
FSIP: 1048/45*
IHP: 2135/2135*
FHP: 2135/2135*
Chlorides: 17,000 ppm

LS,crm fn xln sucr poro; pr interport poro

LS,crm fn xln v. sol; pelmicrite poorly sorted; fr-fair interport poro; fr odor

LS,crm fn xln v. sol; pr interport poro; dense NSHO

LS,crm fn xln fossil pr interport poro; NSHO

LS,crm fn xln sol; pr interport poro; NSHO

LS,crm-wht fn xln sil oolicastic pr interport poro NSHO

LS,crm fn xln v. oolitic; pelsparite poorly sorted; fair interport poro; fr odor

LS,tan fn xln sil oolicastic pr interport poro; dense NSHO

St. L "C"

4800

ELEVATION: KB 2897

OPERATOR: Hartman Oil Co., Inc. LOCATION: 330FS & 1475FE

LEASE: Ward Twin WELL NO. #4 SEC. 16 TWP. 22S RNG. 33W

API: 15-055-22,481 FIELD: Damme COUNTY: Finney STATE: Kansas