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Driller's Log

Sears #15-2-16-24 (Section 2-T16S-R24E)
Copied from DL by Rex R. Ashlock

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Surface	20	
Lime	61	
Shale	101	
Lime	109	
Shale	124	
Lime	131	
Shale	171	
Lime	182	
Shale	195	
Lime	221	Test @ 220
Shale	222	
Black Slate	223	
Shale	229	
Lime	248	Test @ 240
Shale	250	
Black Slate	252	
Lime	255	
Shale	260	
Lime	265	"Hertha"
Shale	270	
Sandy Shale	278	
Shale	291	Test @ 280
Shaly Sand	296	
Sandy Shale	300	
Shale	370	
Sand	375	Test @ 380
Shale	409	
Black Slate	411	
Shale	413	
Sandy Lime	414	
Sand	421	Test @ 420
Shale	425	
Sandy Lime	430	
Shale	447	Test @ 440
Lime	452	
Shale	453	
Lime	457	
Shale	465	
Lime	474	
Shale	492	Test @ 480
Lime	496	
Black Slate	498	

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Sears #15-2-16-24 Continued

Lime	516	Test @ 500
Shale	530	
Black Slate	531	
Shale	539	
Lime	543	Test @ 540
Shale	553	
Black Slate	554	
Shale	558	
Sand	630	
Shale	640	TD Test @ 640

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Geological Report

Sears # 15-2-16-24 (5th well with new "gas detector")
945 FSL, 1650 FEL (N 38° 40.931', W 94° 43.128')
Section 2-T16S-R24E
Miami Co., KS
API # 15-121-27733
Elevation: 1035 GL (est. from Topo. Map)
Drilling Contractor: Glaze Drilling Co., (Lic. #5885)
Spud: 8/17/2003
Surface: 11 ¼" bore, set 20' of 8 5/8" casing cmt'd w/ 6 sx
Production bore hole: 7 7/8"
Drilling Fluid: Air
Rotary Total Depth (RTD) 640' on 8/20/03
E-Log Total Depth: No Open Hole (Gamma Ray-Neutron run on 8/22/03 to check packer seat depth. Reach 631.5')
Production Casing: 5 ½" set at 498'

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Formation	Driller Log Tops	E-Log Tops	Datum
Stark Shale	221	224	811
Hushpuckney Shale	248	251	784
Base Kansas City	265	267	768
"Upper" Knobtown Sand	No Call	273	762
"Middle" Knobtown Sand	291	292	743
"Lower" Knobtown Sand Zone	No Call	319	716
Carbonaceous Zone in Tacket Fm.	No Call	364	671
"Big Lake" Sand	370	367	668
South Mound Zone	409	412	623
Hepler (Wayside) Sand	414	415	----
"Upper" Mulberry Zone	No Call	454	----
Mulberry Zone	No Call	461	574
Weiser Sand	No Call	477	558
Myrick Station Ls.	492	494	541
Anna Shale (Lexington Coal Zone)	496	498	537
Peru Sand	No Call	----	----
Summit Shale Zone	530	531	504
Mulky Shale/Coal Zone	553	554	481
Squirrel Sand	558	559	476
Bevier Coal Zone	No Call	629	406
Rotary Total Depth	640	----	395
E-Log Total Depth	----	631.5	403.5

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Major Zones of Interest (Depths based on GR-N run on 8/22/03)

Note: Gas test(s) depths and gas readings not corrected to E-Log.
"BG" = Background gas in units
"T" = Total gas reading in units
"Ch" = Chromatograph reading in units
"CG" = Connection gas reading in units

** 190' BG, T = 11.7 & Ch = 12.0

** 195' BG, T = 11.8 * Ch = 11.7

** 196' manually cycled Ch, read 12 units of methane only.

Winterset Limestone, 197-224. Fluid level at 217' when well logged to check packer seat, so no Neutron to determine porosity "breaks" from where the shows may have occurred found in the following sample bags;

** 197' "T" started increasing, at 200' T was at 26.5 (14.7 increase) and Ch was 10.9

** 200' CG = 50.6 units. Ch auto cycled and read 11.3 units of methane

** 205' BG, T = 19.6 & Ch = 11.0

200-210. Limestone, medium gray, gray-tan, light grayish brown, micro to fine crystalline, poor with trace fair crystalline and micro vuggular porosity, argillaceous to silty in part, fossiliferous - abundant bryozoan, no fluorescence, no odor, scattered shows of black tarry hydrocarbon residue where vuggular, and no shows of free gas.

210-220. Limestone, "dirty" grayish-off white, dark tans, micro to very fine crystalline, poor with trace fair porosity, trace dolomitic, no to very questionable odor, no fluorescence, no show of gas, fair show of very-very dark brown to black somewhat tarry oil, but mostly "dead" hydrocarbon residue. When diluted HCl acid applied, oil breaks out, but again not what you would call "live oil". The Winterset does not merit further testing at this time.

** 210' BG, T = 17.8 & Ch = 11.4

** 210', "T" starting climbing again, at 211' Ch auto cycled and read 29.4 units (18.1 inc.) of methane only. At 212' T = 27 (9.2 increase) and Ch = 11.3. By 214' T = 28.3 (1.3 increase) or a total of 10.5 increase over the 210' reading. Ch at 214' read 10.7.

** 220' BG, T = 27.4 & Ch = 9.9.

** Gas test at 220', no open flow and no water reported.

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** 220', CG = 111.9 (61.3 increase over 200's CG). Again, no shows of free gas were observed in the Winterset, but the gas detector does indicate the presence of "some" gas and should be further investigated if future wells are drilled in the immediate area.

Stark Shale, 224-227. Shale, black, blocky, trace angular cuttings, gritty textured and pyritic in part, no shows of free gas.

** 236' BG, T = 51.3 (23.9 increase) & Ch = 7.1

** 240' BG, T = 46.1 & Ch = 7.1

** Gas test at 240', had a very-very weak open flow, estimated less than 1 MCF and the Driller reported zone as having "maybe just a trace of water, really just damp"

** 240', CG = 216.3 (104.4 increase) Starting to let CG circulate out of well bore and through detector before drilling ahead.

** 242' BG, T = 45.3 & Ch = 4.9

** 247' BG, T = 39.4 & Ch = 4.6

** 248', something goofed up and depth counter jumped to 253', also Driller started misting at this depth. Ch auto cycled and read 58.8 units of methane only. Corrected depth at 260'.

Hushpuckney Shale, 251-254. Shale, black, blocky to platy cuttings, trace with gritty texture, pyritic, trace dark to medium gray shale, no show of free gas. Estimated initial "gas kick" for Hushpuckney at 329 units.

** 260', kelly down, T started climbing, peaked at 218.

** Gas test at 260', open flowed 16 MCF (est. 15.5 MCF increase) and zone making water, volume not available. Shut valve on diverter/flow line to test and got a big false gas kick(s), but this a normal occurrence after testing for open flow gas. Ch auto cycled and read 3570.9 units of methane only, T was reading 407.8 BG at this time.

Note: Water pump, used to mist with, broke so crew stopped to work on same. 1: 46 P.M.: BG, T = 399 & Ch = 54. 1: 50 P.M.: BG, T = 403 & Ch = 252, manually cycled Ch at this time and read 14,328 units of methane only. 1:55 P.M.: BG, T = 453.6 & Ch = 255.2. 2:01P.M: BG, T = 434 and Ch = 228. 2:04 P.M.: BG, T = 466.7 & Ch = 209.6. Switched attenuator to x4, but units started to increase (due to CG) peaked at 1722.8. When T read 396.9, took a manual Ch reading, read 6644 units of methane only. 2:10 P.M.: BG, T = 764 & Ch = 194. Switch T & Ch to x8 and stabilized at around 551.2 for T and 236 for Ch.

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At 2:17 P.M. Ch auto cycled and read 17,990.4 units of methane only. Just before cycle T was at 472 and after cycle was 496. 2:36 P.M. (still at 260') BG, T = 594.4 & Ch = 344. Manually cycled Ch again and read 15,730.4 units of methane only.

"Upper" Knobtown Sand Zone. 273-278. Silt/sandstone, light to medium brown with pale green tint in part, becoming laminated, silty, shaly, micaceous, and grading more to all pale green color with depth, silt size to very fine grain, poorly sorted, well consolidated, mostly poor porosity, no to questionable odor, no fluorescence, good stain, no show of free oil or gas.

** 275' BG, T = 124.8 & Ch = 19.2

** 280' BG, T = 117.6 & Ch = 12. Ch auto cycled and read 552.8 units of methane only. Re-tested open flow, no increase, open flowed 8 +/- MCF (8+/- decrease) and no increase in water. Had the usual "gas test" spike and corrected depth. CG = 781.6

** 285' BG, T = 125.6 & Ch = 6.4

"Middle" Knobtown Sand Zone. 292-299. Sandstone, very shaly sand to very sandy shale, gray, very fine grain, poorly sorted, well consolidated, friable to firm, fair to poor porosity, no fluorescence, weak to fair odor, very weak to weak show of dark brown free oil and black hydrocarbon residue. No increase in gas units.

** 295' BG, 108.8 & Ch = 4

** 300', CG = 669.6

** 318' BG, T = 111.2 & Ch = .4

** 320', Re-zeroed Ch to read 83.2 +/-. CG = 404

"Lower" Knobtown Sand Zone, 318-350. Poorly developed, mainly a very silty to very sandy, calcareous, somewhat medium gray shale, fossiliferous in part, no shows.

** 332' BG, T = 119.2 & Ch = 84

** 340', Ch auto cycled and read 618.4. CG = 336

** 347' BG, T = 104.8 & Ch = 80

** 354' BG, T = 100 & Ch = 78.4

** 360' BG, T = 100 & Ch = 79.2. Ch auto cycled and read 1032 units of methane only. CG = 362.4 (26.4 inc. over 340's, see Carbonaceous Zone in Tacket)

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Carbonaceous zone in Tacket Formation. 364-367. Shale, dark to very dark grays, black, carbonaceous and fossiliferous in part, trace coal and "coaly-shale", no "floaters", no shows of free gas, and slight increase in gas units at the 360' connection.

** 370' BG, T = 104 & Ch = 78.4

"Big Lake" Sand, 367-379. Sandstone, very-very light to light tan, fine grain, angular, poorly sorted, well consolidated, friable to firm, fair to poor porosity, weak odor, no fluorescence, "sheen" show of oil. Diluted HCl acid helped a little to break out a somewhat better sheen, but no shows of free oil or gas.

** 380', BG started to increase, peaked at 228 (124 unit increase), but note CG at 380'

** Gas test at 380', open flowed 22 MCF, a 14 MCF increase, no noticeable increase in water. CG = 1378.4 (1016 unit increase over 360's)

** 388' BG, T = 246.4 & Ch = 94.4

** 391' BG, T = 241.6 & Ch = 94.4

** Ch auto cycled and read 1440 units of methane only.

** 400', CG = 1378.4, no change

South Mound Zone, 412-415. (In order collected) Shale, black, blocky to platy, trace pyritic, trace tarry hydrocarbon residue along some fracture planes, no show of free gas. Trace dark chocolate brown, gritty shale with very-very weak show of free gas. Black, platy shale with no show, trace "coaly shale" and coal, a few were "floaters", scattered very weak shows of free gas.

Hepler (Wayside) Sand Zone. 415- 434. Sample bags covering this footage were 410-420, 420-430, 430-440, and contained the following:

410-420. Sandstone, tan to medium tan, fine grain, sub-rounded to very angular, poorly with trace moderately sorted, well consolidated, mostly firm, fair porosity, fair to good odor, very-very dull fluorescence, weak to fair show of free oil, a few sand clusters with good shows of free oil. Diluted HCl acid helps break out oil.

** 418' BG, T = 276.8 & Ch = 88

** 420' BG, T = 279.2 & Ch = 81.6. Manually cycled Ch, read 1317.6 units of methane only. Gas tested, open flowed 35 MCF or a 13 MCF increase, no apparent increase in water.

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Hepler (Wayside) Continued

420-430. Sandstone (a little conglomeritic) fine to coarse grain, sub-rounded to very angular, very poorly sorted, very well consolidated, very firm, dense, poor porosity, abundant calcareous fragments to the point of being a sandy limestone, trace fractured, few scattered vugs with very good show of dark brown oil, no show of gas, dull uniform fluorescence, very good to excellent odor, HCl acid helps break out the oil.

Note: Prior to plugging and abandonment, the Hepler (Wayside) Sand should be tested for commercial oil production.

Note: At 420' shut down for the day.

430-440. Shale, pale green, scattered thin lamina of siltstone and sandstone as above, with very-very weak scattered shows of free oil.

** 432' BG, T = 276 & Ch = 228.8

** Gas test at 440', open flowing 22 MCF (lost 13 MCF), no increase in water. Auto cycled, read 1353.6 units of methane only. CG = 1414.4

** 450' BG, T = 244.8 & Ch = 216.8

** 451', Ch auto cycled, read 1535.2 unit so methane only.

"Upper" Mulberry Zone, 454-456. No black shale, coal or "coaly shale" fragment were found in the sample bag covering this footage. There was a small percentage of dark chocolate brown shale with a few scattered carbonaceous fragments, but exhibited show of free gas.

** 460' BG, T = 247.2 & Ch = 199.2

** 460', CG = 1348

Mulberry Zone, 461-464. No carbonaceous material found in sample bag covering this footage.

** 468', Ch auto cycled, read 1631.2 units of methane only, (96 unit increase over auto cycle at 451').

** 474' BG, T = 256.8 & Ch = 184.8

Weiser Sand, 477-482. Shale, gray with green tint, silty to very silty, scattered very thin lamina consisting of light tan, silt/sandstone, silt size to very fine grain, weak to fair odor, no fluorescence, "sheen" show of oil.

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** 480' BG, T = 257.6 & Ch = 183.2. Ch auto cycled and read 1544 units of methane.

** Gas test at 480', open flow tested 27 MCF or a 5 MCF increase. Had the normal gas test spike. CG = 876.8.

Note: Even with the 5 MCF open flow, cannot recommend further testing the Weiser Sand at this time.

** 494' BG, T = 279.2 & Ch = 273.6. Ch, auto cycled and read 1796.8 units of methane. (Slight increases due to gas in Weiser and possible a little left over from CG.)

** 497' BG, T = 280.8 & Ch = 266.4

Anna Shale (Lexington Coal Zone), 498-501. Shale, black, blocky, no show, trace angular with gritty texture, scattered very-very weak show of free gas. Coal and "coaly-shale", fair percent were "floaters", no apparent shows of free gas.

** At 500', "T" started climbing, stabilized at 562.4 (281.6 increase). Shortly, Ch auto cycled and read 4424 (a 2627.2 unit increase over the 480' auto cycle and T was at 537.6 units when Ch auto cycled).

** Gas test at 500', open flowed 54 MCF or a 27 MCF increase, along with an increase in water. Several gas test spikes after testing.

** 500', CG = 1400.8, (a 524 unit increase over 480's CG)

** 512' BG, T = 539.2 & Ch = 308.8

** 514', Ch auto cycled, read 3687.2 units of methane only

** 520' BG, T = 556 & Ch = 228.8

** 520', CG = 1411.2

Summit Shale Zone, 531-534. Shale, black, blocky, trace pyritic, and contained no visible shows of free gas.

** 532', Ch auto cycled, read 6227.2 (a 2540 unit increase over the auto cycle at 514').

** 540' BG, T = 870.4 (a 314.4 increase) & Ch = 276.8 (a 48 unit increase)

** Gas test at 540', open flowing 49 MCF or a 5 MCF decrease, no apparent increase in water. CG = 1400.

Note: Driller forgot to allow enough time to let CG pass before drilling ahead, so at 544' BG, T = 805.6 & Ch = 412

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** 549' BG, T = 758.4 & Ch = 403.2

** 553' BG, T = 735.2 & Ch = 397.6

Mulky Shale/Coal Zone, 554-559. Shale, black, blocky to angular, pyritic, weak show of free gas from angular cuttings only. Trace coaly-shale and coal, no visible shows of free gas. No apparent increase in gas units.

** 558' BG, T = 728 & Ch = 392

** 559' BG, T = 716.8 & Ch = 388.8

** 560' BG, T = 709.6 & Ch = 384.5

** Gas test at 560', open flowed 69 MCF (20 MCF increase) and questionable increase in water.

** 560', CG = 1400.8

Squirrel Sand, 559-576. Sandstone, light tan, light tan with pale green to grayish tint, sandstone becomes a little darker tan with depth, silt size to mostly fine grain, angular to very angular, poorly sorted, well consolidated, firm, poor to trace fair porosity, micaceous, somewhat shaly, very-very dull to questionable fluorescence, no noticeable odor, and gave off a "rainbow" to "sheen" show of oil.

** 568' BG, T = 684.8 & T = 397.6

** 575', Ch auto cycled and read 5024 units of methane only

** 579' BG, T = 680 & Ch = 380.8

** Gas test at 580', open flowed 60 MCF (decrease of 9 MCF)

** 580', CG = 1418.4

580-602. Sandstone, medium tans, very fine to fine grain, poorly sorted, well consolidated, mostly firm with trace semi firm, poor to fair intergranular porosity, becoming very carbonaceous with depth, scattered silty to shaly lamina and silty to sandy shale breaks, no fluorescence, very-very weak odor, "sheen" show of oil, very-very weak scattered shows of free gas in a very few sand clusters where carbonaceous.

** 591' BG, T = 652.8 & Ch = 364

** 593', Ch auto cycled and read 4631.2

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Squirrel Sand Continued

** 600' BG, T = 643.2 & Ch = 361.6

** 600', CG = 1409.6

605-629. Sandstone, grayish-tan, very fine to medium grain, angular to very angular, poor to very poorly sorted, moderately to very well consolidated, friable, fair to good porosity, carbonaceous in part, slight increase in silty, shaly, carbonaceous lamina with depth, same type shows as above.

Note: The Squirrel Sand does not merit further testing at this time.

** 605' BG, T = 637.6 & Ch = 320.8

** 614' BG, T = 629.6 & Ch = 309.6

** 620' BG, T = 625.6 & Ch = 304. Ch auto cycled and read 4152 units of methane only

** 620', CG = 1390.4

** 627' BG, T = 623.2 & Ch = 284

Bevier Coal Zone, 629-632+/- (base not logged). Shale, gray-greens and green-grays, trace carbonaceous fragments in part. Coal, fractured in part, trace secondary crystallization, abundant "floaters", no visible shows of free gas, (possibly due to slight oil sheen on cuttings which hinders gas shows from carbonaceous material). The "coal" is estimated to be no more than one foot thick.

** 632' BG, T = 620.8 & Ch = 275.2

** 638' BG, T = 614.4 & Ch = 276

** 639' BG, T = 632.8 (slight inc. of 18.7 units) & Ch = 275.2

** 640' (RTD), Ch auto cycled and read 4544 (392 inc. over 620's auto cycle) units of methane only. Circulated on well, BG was: T = 624.8 & Ch = 276.8. Final gas test, no increase, still 60 MCF and no apparent increase in water noted by Driller.

Croweburg Zone, Not drilled.

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Brief Summary:

Stark	<1 MCF, "damp"
Hushpuckney	15.5 MCF, increase in water
"Upper" Knobtown	Good oil stain, no shows gas or oil, no increases
"Middle" Knobtown	Very weak show oil, no increases
"Big Lake" Sand	14 MCF, "sheen" shows of oil, no increase in water
South Mound	13 MCF, no increase in water
Hepler (Wayside)	Weak to fair show of free, no increase in water
Mulberry(s)	No increase in open flow or water
Weiser Sand	5 MCF, "sheen" show of oil, no increase in water
Lexington	27 MCF, fair increase in water
Summit	No increase in open flow or water
Mulky	20 MCF, no apparent increase in water - questionable
Squirrel Sand	No increase in open flow or water
Total open flow	95+/- MCF (Final open flow at end of drilling, 60 MCF)

** Structural comparison of the subject well using the Top of the Lexington:

Sears 15-2	Sears 10-3	Hopkins 8-2	Hopkins 11-1	Hopkins 4-1
537	529	484	492	544

End Report
Rex R. Ashlock

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