



00244905

BEST IMAGE
AVAILABLE

WELL SUMMARY

OPERATOR: C.R.A., Inc.

WELL: # 1-A Govt. (Hiawatha Area)

CLASSIFICATION: Wildcat

LOCATION: 1320' fnl x 850' fel of S17-T11N-R100W,
Moffat County, Colorado

ELEVATION: 6425' Ground 6437' KB

SPUDDED: October 31, 1965

FINISHED DRILLING: December 8, 1965

CONTRACTOR: Signal Drilling Co., Denver, Colorado
Toolpusher: Ted Strader

CASING: 10-3/4" @ 501' w/500 sx.
7-5/8" @ 6738' w/380 sx.

CORES: None

DRILL STEM TESTS: Five DST'S - See Details

LOGGING SERVICES: Baroid 2-man Logging unit 1750'-6741'
Schlumberger: IES 504-6715; 6733-6956
SGRC 504-6714; 6733-6955
FAL 2650-6714
Temp. 3000-6670

SAMPLES: American Stratigraphic Co., Denver, Colorado

TOTAL DEPTH: 6951' (Driller) 6956' (Schlumberger)

STATUS: Plugged & Abandoned

FORMATION TOPS:

| | |
|------------|--------------|
| Wasatch | (Surface) |
| Ft. Union | 2693' (3732) |
| Lewis | 5058' (1367) |
| Mesaverde: | |
| Almond | 5745' (680) |
| Ericson | 6694' (-269) |

CHRONOLOGICAL LOG

BEST IMAGE
AVAILABLE

Oct. 31, Spud 11:30 P. M.
Drilled 0-59 - 15" hole

Nov. 1, Drilled 59-76 - Lost circulation at 72' - mixing mud - lost
approx. 2100 Bbls. Returns @ 11:30 P.M.

" 2, " 76-500
" 500-613 - 9-7/8" hole

" 3, " 613-868

" 4, Ran 16 joints, 486.48' of 10-3/4", H-40, 32.75#
casing - landed at 501' KB - Cemented by Howco
with 500 Sx 50/50 Posmix, 2% gel & 2% CaCl₂, followed
by 50 Sx. regular cement, 2% CaCl₂. Circ. Cement.

" 5, Pressure up to 1000# - OK - Drilled plug 7:00 P.M.
Drilled 868-1140 - 9-7/8" hole

" 6, " 1140-1574

" 7, " 1574-2065

" 8, " 2065-2612

" 9, " 2612-2955

" 10, " 2955-3278

" 11, " 3278-3555

" 12, " 3555-3822

" 13, " 3822-4015

" 14, " 4015-4220

" 15, " 4220-4490

" 16, " 4490-4639

" 17, " 4639-4947

" 18, " 4947-5085

" 19, " 5085-5144 - Condition mud for DST - 18 hours.

" 20, " 5144-5267 - DST # 1 5115-5144 - Packer failure.

| | | | |
|----------|---------|---|---|
| Nov. 21, | Drilled | 5267-5559 | |
| " 22, | " | 5559-5809 | - 5½ hours circulate and condition hole. |
| " 23, | " | DST # 2 - 5738-5809 | - Rec. 750' SGCM (See Details) |
| | | 5809-5840 | |
| " 24, | " | 5840-5998 | |
| " 25, | " | 5998-6156 | |
| " 26, | " | 6156-6278 | |
| " 27, | " | 6278-6423 | - Circulate for DST 2 hours |
| " 28, | " | DST # 3, 6388-6423 | - GTS in 10" - Max. 211 MCF - See Details |
| | | 6423-6454 | |
| " 29, | " | 6454-6614 | |
| " 30, | " | 6614-6706 | |
| Dec. 1, | | Ran Schlumberger logs preparatory to running 7-5/8" casing. Installed new motor on draw works - pipe strap correction T.D. from 6706' to 6714'. | |
| " 2, | " | DST # 4, 6697-6716 | (Schlumberger measurement) See Details |
| | | 6714-6728 | (re-strap pipe found T.D. at 6714') |
| " 3, | " | 6728-6741 | |
| | | DST # 5, 6719-6741 | - Rec. 10' mud - See Details |
| " 4, | | Circulate hole - preparing to run 7-5/8" casing Running casing. | |
| " 5, | | Ran 6740.59' of 7-5/8", N-80, 26.40# casing and landed at 6738' (KB) Cemented by Howco with 380 Sx. Plug down at 2:45 A.M. | |
| " 6, | | WOC - Nippling up for air drilling | |
| " 7, | | Blowing and drying hole | |
| | Drilled | 6741-6779 | - Compressor broke down prep. to trip. |
| " 8, | " | 6779-6951 - At 6795' a brief (1 minute) blow of gas and died - stopped dusting - slight moisture - making pencil sized stream of water - cannot dry up - filled hole with mud - circulate preparatory to running logs | |
| " 9, | | Circulate and condition hole - Ran logs. | |
| " 10, | | Wait on Orders | |
| " 11, | | Preparing to pull 7-5/8" pipe - prep to plug & abandon | |

BEST IMAGE
AVAILABLE

SAMPLE DESCRIPTION

- 870-930 Shale, light gray to medium gray predominant, some tan to maroon - some mottling.
- 930-990 Shale, light gray, tan, maroon - mottled, blocky.
- 990-1080 Shale, light to medium gray with abundant tan and maroon shale.
- 1080-1200 Shale, light gray to medium gray, blocky with trace of tan and maroon shale - some greenish-gray shale.
- 1200-1560 Shale, light gray, medium gray, greenish-gray, with considerable brown, tan and maroon shale - some mottling - locally slightly micaceous.
- 1560-1810 Shale, light gray, medium gray and greenish-gray, with only trace of variegated shale.
- 1810-2110 Shale, as above, some variegated shale, some mottling.
- 2110-2140 Shale, as above, with considerable, medium grained, free sand grains in sample
- 2140-2230 Shale & Sandstone, shale as above, sandstone is light gray to white, fine to coarse grained - all drilled up into individual sand grains.
- 2230-2500 Shale, light gray to medium gray, some greenish-gray, blocky.
- 2500-2530 Shale & Sandstone, shale as above; sandstone is light gray, fine grained, friable but shows some clay-filling - numerous free sand grains. Note: Drilling time suggests mostly sand 2490-2525.
- 2530-2680 Shale, light gray to medium gray predominant, some greenish-gray, some maroon - some mottling.
- 2680-2690 Shale, as above with considerable dark gray, carbonaceous, locally sandy shale.
- 2690-2700 Sandstone, light gray, fine grained, salt & pepper, sub-angular to sub-rounded, friable but mostly clay-filled tight.
- 2700-2710 Coal, low grade sub-bituminous with much sandstone as above - may be coal from 2701-06, with shale below 2706.
- 2710-2720 Shale, medium gray with some fairly dark gray carbonaceous shale.
- 2720-2730 Shale, as above with considerable coal.

- 2730-2770 Sandstone, light gray, fine grained, salt & pepper, friable but clay-filled tight. Probably mostly sand 2728-66.
- 2770-2780 Shale & Coal, shale is light gray to medium gray, locally silty, coal sub-bituminous.
- 2780-2790 Shale, light gray to medium gray, silty, with considerable coal.
- 2790-2800 Coal, sub-bituminous.
- 2800-2850 Shale, light gray to medium gray, blocky, few streaks of carbonaceous material - some coal.
- 2850-2860 Skip
- 2860-2880 Shale, light gray to medium gray, blocky, some bentonite.
- 2880-2900 Shale, as above, with minor amount of coal, probably in thin streaks in shale body.
- 2900-2940 Shale, medium gray predominant, some fairly dark gray, blocky, locally slightly carbonaceous - trace lavender shale.
- 2940-2960 Shale, medium gray predominant, some light and dark gray, locally slightly carbonaceous - some gray to tan mottling.
- 2960-2980 Coal, sub-bituminous, much shale as above in samples.
- 2980-3000 Sandstone, light gray, fine grained, salt & pepper, fairly hard, dirty and tight - NSOF.
- 3000-3020 Coal, sub-bituminous - with perhaps thin beds of shale and sand.
- 3020-3050 Shale, medium gray, blocky, locally carbonaceous, with much light gray, fine to very fine grained, salt & pepper, dirty, tight sandstone grading to siltstone.
- 3050-3060 Coal, sub-bituminous (coal may be 3052-58).
- 3060-3070 Sandstone, light gray, fine to very fine grained, dirty, tight, with local carbonaceous streaks.
- 3070-3090 Coal, as above, probably from 3077-87.
- 3090-3110 Sandstone, light gray, fine to very fine grained, salt & pepper, dirty, tight - much gray shale - some silty and grades to siltstone.
- 3110-3150 Sandstone, shale & coal, all as above, perhaps interbedded
- 3150-3180 Sandstone, light gray, fine to very fine grained, dirty, tight - much shale and coal in samples.

- 3180-3220 Shale, medium gray predominant, some fairly dark gray, locally carbonaceous shale, some silty - trace bentonite.
- 3220-3240 Coal, sub-bituminous - random shale beds in coal.
- 3240-3320 Shale, medium gray, some slight greenish-gray, blocky, some tan and gray mottling. Some light gray, fine grained sandstone.
- 3320-3340 Shale & coal, shale as above, considerable sand as above.
- 3340-3370 Shale, medium gray to dark gray, carbonaceous and silty.
- 3370-3390 Sandstone & shale, sandstone is light gray, fine to medium grained, salt & pepper, fairly friable but tight; shale as above.
- 3390-3420 Coal, sub-bituminous (coal may be 3385-3417(?)).
- 3420-3470 Shale, medium gray to dark gray, mostly carbonaceous, possibly few streaks of coal.
- 3470-3480 Coal, with much siltstone and shale.
- 3480-3500 Shale, medium gray to dark gray, locally carbonaceous, abundant light gray siltstone.
- 3500-3540 Siltstone, light gray, slightly carbonaceous, salt & pepper, fairly hard, locally slightly calcareous, much gray shale.
- 3540-3570 Coal & shale, as above, possibly interbedded shale and coal.
- 3570-3590 Shale, medium gray to dark gray, carbonaceous, some brown shale showing some poorly preserved fossil remains (Ostracods?). Considerable light gray, fine grained sandstone.
- 3590-3620 Sandstone, light gray, fine to very fine grained, salt & pepper, fairly hard, dirty and clay-filled tight - no fluorescence in wet sample but an occasional fragment gives a very dull, near white fluorescence in dry sample.
- 3620-3630 Coal, low grade sub-bituminous, grades to lignite and very carbonaceous shale - a few poorly preserved fossil remains.
- 3630-3710 Shale, medium gray to dark gray, blocky, carbonaceous, with some interbedded coal and abundant light gray, fine grained, dirty, tight sandstone.
- 3710-3720 Skip
- 3720-3750 Sandstone, light gray, fine grained, salt & pepper, fairly hard, dirty, tight, grades to very fine grained to siltstone - much gray shale, with apparent thin streaks of coal.

- 3750-3820 Sandstone, light gray, fine to very fine grained, fairly hard, very dirty and tight, much siltstone.
- 3820-3850 Sandstone & shale, sandstone as above, shale is dark gray, blocky and fissile - locally carbonaceous
- 3850-3860 ----- sample mostly coal, but probably drilled gray to brownish-gray, hard sandstone with a few fragments showing a dull, yellowish, pin-point fluorescence - no cut to very, very slight cut.
- 3860-3870 Coal, probably mostly coal 3861-69 - much sand and shale in sample.
- 3870-3880 Coal, probably 3877-79 - remainder shale.
- 3880-3910 Shale, dark gray, blocky to fissile, fairly hard, carbonaceous, locally silty.
- 3910-3930 Sandstone, medium gray to light gray, fine to very fine grained,, salt & pepper, hard, dirty, tight.
- 3930-3950 Coal & Shale, coal low grade sub-bit.; shale is dark gray to black, very carbonaceous with numerous coal flecks.
- 3950-4000 Shale, dark gray, blocky to fissile, carbonaceous with few flecks of coal - considerable gray siltstone.
- 4000-4100 Shale, as above with possibly few thin coal streaks, also some siltstone.
- 4100-4450 Shale, medium gray to dark gray, blocky to fissile, locally carbonaceous with a few flecks of coal found locally - an occasional trace of light gray siltstone.
- 4450-4480 Sandstone, light gray to medium gray, very fine grained, dirty, tight and grades to siltstone.
- 4480-4550 Shale, medium gray to dark gray, mostly blocky. locally carbonaceous with a few flecks of coal in dark gray shale.
- 4550-4560 Sandstone, light gray to medium gray, fine grained, dirty (much carbonaceous material). very tight and grades to siltstone.
- 4550-4580 Shale & Sandstone, shale is medium gray to dark gray, mostly blocky, locally carbonaceous, few flecks of coal, considerable bentonite; sandstone is light gray, very fine grained, clay-filled tight.
- 4580-4780 Shale, medium gray to dark gray, blocky to fissile, locally slightly carbonaceous - some bentonite locally.
- 4780-4900 Shale as above, with a few thin streaks of siltstone, grading to very fine grained, tight sandstone.

- 4900-4920 Sandstone, light gray, fine grained, salt & pepper, friable but clay-filled tight - gives a good, blue-white fluorescence, poor, slow cut - good cut when crushed - 35 units gas.
- 4920-4930 Coal, sub-bituminous (coal probably 4921-29) 140 units gas.
- 4930-4950 Shale, medium gray to dark gray, locally carbonaceous - some gray siltstone - probably some coal.
- 4950-4980 Sandstone, light gray, fine grained, salt & pepper, friable, dirty and clay-filled - gives fair blue-white fluorescence, poor to fair cut.
- 4980-5000 Shale, medium gray to dark gray, locally carbonaceous & silty.
- 5000-5010 Coal, good sub-bituminous, bubbles much gas from fresh samples - 200 units gas, some of which is probably trip gas.
- 5010-5020 Shale, medium gray to dark gray, locally carbonaceous.
- 5020-5040 Sandstone, light gray to tan, some light brown, fine to medium grained, sub-angular to sub-rounded, fairly friable but tight.
- 5040-5060 Sandstone, light tan to white, coarse grained, some finely conglomeratic, sub-rounded to sub-angular, much milky chert in sample - probably in form of chert pebbles - appears to have good porosity but effective porosity is probably reduced by clay-filling.
- 5060-5110 Shale, mostly dark gray, usually silty, locally carbonaceous.
- 5110-5125 Sandstone, light gray to light brown, fine to medium grained, some light brown oil stain, but not 100% - good blue-white fluorescence & fair to good streaming cut - approximately 75% of sand shows oil stain - only 35 units of gas - does not appear to be a good, live oil stain - may be water bearing.
- 5125-5135 Sandstone, as above, but only minor amount showing oil stain.
- 5135-5145 Sandstone, mostly light gray fine to medium grained, salt and pepper, virtually no stain - still fair fluorescence and fair to poor cut.
- 5145-5220 Sandstone, light gray, fine grained, ill-sorted, salt & pepper, friable but appears to be completely clay-filled. NSOF.
- 5220-5230 Siltstone, medium gray, grading to silty shale.
- 5230-5320 Shale, medium gray to dark gray, blocky, locally silty and locally grades to siltstone.
- 5320-5730 Shale, dark gray, blocky to fissile, locally slightly silty, some finely disseminated mica.

- 5730-5740 Shale, as above with considerable light gray, fine grained, salt & pepper, friable but clay-filled tight sandstone. shows good blue-white fluorescence, fair to good cut in CCl_4 .
- 5740-5760 Sandstone, light gray, fine grained, salt & pepper, Ill-sorted, mostly clay-filled but may be some effective porosity - good fluorescence and cut - 120 units gas.
- 5760-5800 Sandstone, light gray, fine grained, salt & pepper, few clusters, mostly free sand grains in samples - fair to good fluorescence - fair cut.
- 5800-5810 Shale, dark gray, blocky - much sand as above still in samples.
- 5810-5830 Coal, sub-bituminous - possibly a few shale streaks. Drilling time suggests coal 5814-25.
- 5830-5890 Sandstone, light gray, fine grained, salt & pepper, friable but clay-filled - considerable carbonaceous material. NSOF.
- 5890-5920 Shale, medium gray to dark gray, locally carbonaceous & silty.
- 5920-5950 Sandstone, light gray to nearly white, fine grained, salt and pepper, friable but completely clay-filled, no visible permeability - good blue-white fluorescence, virtually no cut except when sample is crushed - drilling time suggests some coal immediately above sand - some coal in sample.
- 5950-5980 Sandstone, light gray, very fine grained, hard, diety, tight and grades to hard siltstone.
- 5980-6000 Shale, dark gray, locally silty, locally slightly carbonaceous.
- 6000-6010 Coal - drilling time suggests coal 6001-04.
- 6010-6025 ----- only coal in samples - drilling time suggests coal break 6020-25.
- 6025-6040 Sandstone, light gray, fine to very fine grained, salt & pepper, fairly hard, completely clay-filled, very dirty, NSOF.
- 6040-6050 Sandstone, light gray, fine grained, friable but clay-filled gives dull, golden fluorescence - no cut - some coal in sample, probably a thin coal bed at top of sand - 90 units gas.
- 6050-6085 Sandstone, as above, with maximum gas of 120 units tapering off to about 75 units at base.
- 6085-6090 Coal - drilling time suggests coal 6081-87.

- 6090-6110 Sandstone, light gray to medium gray, very fine grained, dirty, tight and grades to siltstone.
- 6110-6130 Shale, dark gray, blocky, locally silty and carbonaceous.
- 6130-6140 Coal, sub-bituminous - (by drilling time 6138-43)
- 6140-6150 Shale, dark gray, blocky to fissile, carbonaceous.
- 6150-6160 Skip
- 6160-6200 Shale, as above, with probably several thin streaks of coal.
- 6200-6210 Coal, (by drilling time coal 6209-13)
- 6210-6225 Sandstone, light gray, fine grained, fairly hard, very tight, slightly calcareous.
- 6225-6260 Shale, dark gray, blocky, hard, carbonaceous, some finely disseminated mica.
- 6260-6290 Sandstone, light gray, fine to very fine grained, slight salt and pepper, tight, calcareous, much clay-filling - drilling time suggests sand 6267-82.
- 6290-6300 Coal
- 6300-6310 Shale, dark gray, blocky to fissile, locally carbonaceous, hard.
- 6310-6330 Sandstone, light gray, fine to very fine grained, dirty and silty, very tight - gives a dull blue-white fluorescence - no cut - 75 units gas in top of sand - possibly a streak of coal at base.
- 6330-6340 Sandstone, as above, slight fluorescence, no cut.
- 6340-6350 Coal, mostly coal in sample, may be drilling some sand.
- 6350-6370 Sandstone, light gray, fine to very fine grained, dirty, tight, gives a dull, golden fluorescence - no cut - one short, fast peak of 100 units.
- 6370-6380 Sandstone, medium gray to brownish-gray, very fine grained, dirty, tight and grades to siltstone, slightly calcareous.
- 6380-6410 Sandstone, light gray, fine grained, fairly friable but has some clay-filling - dull to bright blue-white fluorescence - good cut - 190 units gas - drilling time suggests sand 6386-6403.
- 6410-6450 Shale, dark gray, blocky to fissile, fairly hard. locally silty.

- 6450-6460 Sandstone, light gray, fine grained, clay filled to siliceous cement, hard, very tight, very slight dull gold to bronze fluorescence - no cut.
- 6460-6530 Shale, dark gray, blocky to fissile, carbonaceous with some coal
- 6530-6560 Shale & sandstone, shale as above,; sandstone is light gray, fine to very fine grained, hard, tight and grades to siltstone.
- 6560-6590 Sandstone, light gray, fine to very fine grained, fairly hard, tight and clay-filled.
- 6590-6620 Shale, dark gray, blocky to fissile, locally carbonaceous, some finely disseminated mica - much coal in samples but probably not drilled.
- 6620-6695 Shale, as above.
- 6695-6725 Sandstone, light gray, fine grained, hard, tight, some siliceous cement.
- 6725-6741 Sandstone, as above, slow drilling, poor samples, ran 7-5/8" casing to 6741'

Air Drilling below 6741'

- 6741-6760 Dust - cleaning up hole - mostly cement.
- 6760-6795 Dust - probably sandstone - samples contain mostly fine, individual sand grains. At 6795' a puff of gas, burning a 20' flare for one minute and died. Hole stopped dusting at this point, some moisture came into hole - began making a stream of water about size of a lead pencil.
- 6795-6951 No Returns - hole making some moisture - would drill 30' then add detergent and water to clean hole - no sample recovery.

DRILL STEM TESTS

DST # 1 5115-5114 - Test off Anchor - 2 top packers

Packers held 2 minutes and failed - tried to reset tool four times and failed.

Recovery: 750' mud

Flow Pressures not usable

SIP 230# (?)

IHP 2525#

FHP 2525#

DST # 2 5738-5809 - Test off Anchor - 2 top packers

Initial Flow Period 5 minutes

 " Shut-in " 30 "

Final Flow " 90 "

 " Shut-in " 60 "

Tool opened with fair blow, increasing to good blow in 5 minutes - continued throughout test - NGTS

Recovery: 330' SGCM (Approx. 3 Barrels)

IHP 2931#

ISIP 262#

FSIP 262#

IFP 112#

FFP 168#

FHP 2931#

BHT 150°

DST # 3 6388-6423 - Test off Anchor - 2 top packers

IF Period 10 Min.

ISI " 30 "

FF Period 120 Min.

FSI " 60 "

Gas to surface in 10 minutes - Gas immediately on final flow. Gauged gas with volumes as follows:

| | | | |
|------------|-------|-------------|----------|
| 2 Minutes | 205 M | 45 Minutes | 116 M |
| 5 " | 211M | 50 " | 101 M |
| 10 " | 200 M | 55 " | 101 M |
| 15 " | 189 M | 60 " | 95 M |
| 20 " | 171 M | 75 " | 90M |
| 25 " | 153 M | 90 " | 90 M |
| 30 " | 134 M | 105 " | 90 M (?) |
| 35 " | 129 M | 120 " | 90 M (?) |
| 40 " | 121 M | | |

DST # 3 (Cont.)

Recovery: 1' mud in top of tool

IHIP 3217#
IFP (1) 75#
IFP (2) 56#
FFP 0
ISIP 2605#
FSIP 1788#
FHP 3217#
BHT 156°

DST # 4 6697-6716 (Schlumberger Meas.) Test off Anchor - 2 top packers

| | | | | | |
|-----|--------|---------|-----|--------|----------|
| IF | Period | 15 Min. | FF | Period | 120 Min. |
| ISI | " | 30 " | FSI | " | 60 " |

Gas to Surface in 17 Min. - Gauged as follows:

| | | | | | |
|----|---------|--------|-----|---------|--------|
| 5 | Minutes | 11.2 M | 45 | Minutes | 15.7 M |
| 10 | " | 12.7 M | 50 | " | 15.7 M |
| 15 | " | 12.7 M | 55 | " | 15.7 M |
| 20 | " | 12.7 M | 60 | " | 15.7 M |
| 25 | " | 14.3 M | 75 | " | 16.4 M |
| 30 | " | 14.3 M | 90 | " | 17.1 M |
| 35 | " | 14.3 M | 105 | " | 18.5 M |
| 40 | " | 15.7 M | 120 | " | 18.5 M |

Recovery: 130' Mud
45' Muddy Salt Water

Water Tested: 24,000 PPM (Resistivity)
17,500 PPM (Titration)
Mud " 4,000 PPM (Resistivity)
3,200 PPM (Titration)

IHP 3408#
IFP 19#
FFP 57#
ISIP 1917#
FSIP 2389#
FHP 3408#

DST # 5

6720-6741 - Test off Anchor - 2 top packers

| | | | |
|-----|--------|----|---------|
| IF | Period | 15 | Minutes |
| ISI | " | 30 | " |
| FF | " | 65 | " |
| FSL | " | 60 | " |

Tool opened with fair blow and continued throughout Initial Flow Period - On Final Flow tool opened with weak blow and died after 20 minutes.

Recovery: 10' Mud (2200 PPM)

| | |
|------|-------|
| IHP | 3398# |
| IFP | 14# |
| FFP | 14# |
| ISIP | 100# |
| FSIP | 72# |
| FHP | 3398# |

SOLE DEVIATION SURVEYS

| <u>Depth</u> | <u>Deviation</u> | <u>Depth</u> | <u>Deviation</u> |
|--------------|------------------|--------------|------------------|
| 98 | $\frac{1}{2}$ | 2955 | 1 |
| 157 | $\frac{1}{4}$ | 3245 | $\frac{1}{2}$ |
| 211 | $\frac{1}{4}$ | 3504 | 1 |
| 268 | $\frac{1}{4}$ | 3722 | $\frac{1}{2}$ |
| 356 | $\frac{1}{4}$ | 3914 | $\frac{1}{2}$ |
| 451 | $\frac{1}{4}$ | 4015 | $\frac{1}{2}$ |
| 515 | $\frac{3}{4}$ | 4240 | $\frac{1}{2}$ |
| 642 | 1 | 4422 | $\frac{1}{2}$ |
| 769 | $\frac{1}{4}$ | 4639 | $\frac{1}{2}$ |
| 1020 | $\frac{3}{4}$ | 4996 | $\frac{1}{4}$ |
| 1246 | $\frac{3}{4}$ | 5051 | $\frac{3}{4}$ |
| 1342 | $\frac{1}{2}$ | 5287 | $\frac{1}{4}$ |
| 1574 | $\frac{1}{2}$ | 5998 | $\frac{1}{2}$ |
| 1757 | $\frac{1}{2}$ | 6122 | $\frac{1}{2}$ |
| 2010 | $\frac{1}{2}$ | 6536 | 1- $\frac{3}{4}$ |
| 2353 | 1 | 6740 | 2 |
| 2657 | 1- $\frac{1}{4}$ | 6779 | 1- $\frac{3}{4}$ |

BIT RECORD

| RUN No. | SIZE | MAKE | TYPE | IN | OUT | FEET | HOURS |
|---------|-------|-------|--------|------|------|------|--------|
| - | 15 | HTC | OSC | 0 | 500 | 500 | 16-3/4 |
| 1 | 9-7/8 | HTC | OSC3 | 500 | 868 | 368 | --- |
| 2 | " | HTC | OSC3 | 868 | 1152 | 284 | 5 1/2 |
| 3 | " | Smith | DT | 1152 | 1342 | 190 | 5 1/4 |
| 4 | " | HTC | OSC1 | 1342 | 1574 | 232 | 8 |
| 5 | " | HTC | OSC3 | 1574 | 1757 | 183 | 5-3/4 |
| 6 | " | HTC | OSC3 | 1757 | 2065 | 308 | 11-3/4 |
| 7 | " | HTC | OSC3 | 2065 | 2353 | 288 | 9 1/2 |
| 8 | " | HTC | OSC3 | 2353 | 2657 | 304 | 10 1/4 |
| 9 | " | HTC | OSC3 | 2657 | 2955 | 298 | 13-3/4 |
| 10 | " | Smith | DTJ | 2955 | 3275 | 320 | 14 1/4 |
| 11 | " | HTC | OSC3 | 3275 | 3504 | 229 | 11 1/2 |
| 12 | " | Reed | YT3 | 3504 | 3722 | 218 | 14 |
| 13 | " | HTC | OSC1G | 3722 | 3914 | 192 | 9 1/2 |
| 14 | " | HTC | OSC1G | 3914 | 4015 | 101 | 8-3/4 |
| 15 | " | HTC | OSC | 4015 | 4240 | 225 | 17 1/2 |
| 16 | " | Smith | DT2G | 4240 | 4422 | 182 | 10 |
| 17 | " | Smith | DT2G | 4422 | 4521 | 99 | 10 1/4 |
| 18 | " | Smith | DT2G | 4521 | 4639 | 118 | 11 1/4 |
| 19 | " | HTC | OSC1G | 4639 | 4887 | 258 | 13 1/4 |
| 20 | " | HTC | OSC1G | 4887 | 4996 | 109 | 8 1/2 |
| 21 | " | HTC | OSC1G | 4996 | 5051 | 55 | 4 |
| 22 | " | HTC | OWC | 5051 | 5144 | 93 | 7 1/2 |
| 23 | " | HTC | OSC1G | 5144 | 5287 | 143 | 7 |
| 24 | " | HTC | OSC | 5287 | 5559 | 272 | 12 1/4 |
| 25 | " | HTC | OSC1G | 5559 | 5809 | 250 | 11 |
| 26 | " | HTC | OWC | 5809 | 5921 | 112 | 9 1/4 |
| 27 | " | HTC | OWV | 5921 | 5998 | 77 | 6 1/2 |
| 28 | " | HTC | OWV | 5998 | 6122 | 124 | 9-3/4 |
| 29 | " | HTC | OWV | 6122 | 6243 | 121 | 11 |
| 30 | " | Smith | C2 | 6243 | 6357 | 114 | 11 |
| 31 | " | HTC | OWC | 6357 | 6423 | 66 | 5-3/4 |
| 32 | " | HTC | OWC | 6423 | 6536 | 113 | 13 1/4 |
| 33 | " | HTC | OWV | 6536 | 6633 | 97 | 11 1/4 |
| 34 | " | HTC | W7 | 6633 | 6706 | 73 | 11 1/2 |
| 35 | " | HTC | W7 | 6706 | 6741 | 35 | 15 1/2 |
| 36 | 6-3/4 | HTC | W7 | 6741 | 6779 | 38 | 2 1/2 |
| 37 | " | HTC | FRGL-J | 6779 | 6951 | 172 | 9 1/2 |

DRILLING TIME

| | 05 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 00 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 900 | 3 | 3 | 4 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 7 | 5 | 4 | 5 | 6 | 5 | 6 | 6 | 7 |
| 1000 | 5 | 3 | 5 | 8 | 7 | 12 | 5 | 5 | 6 | 6 | 5 | 4 | 3 | 3 | 4 | 5 | 5 | 4 | 5 | 4 |
| 1100 | 4 | 4 | 4 | 4 | 5 | 10 | 10 | 10 | 8 | 8 | 5 | 5 | 5 | 3 | 4 | 4 | 3 | 4 | 3 | 5 |
| 1200 | 6 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 5 | 5 | 4 | 3 | 6 | 9 | 10 | 13 | 9 | 10 | 10 | 9 |
| 1300 | 9 | 10 | 18 | 13 | 12 | 14 | 8 | 12 | 15 | 12 | 10 | 8 | 7 | 8 | 16 | 11 | 10 | 9 | 8 | 9 |
| 1400 | 15 | 14 | 5 | 6 | 6 | 8 | 7 | 6 | 7 | 8 | 5 | 5 | 5 | 7 | 11 | 11 | 13 | 11 | 6 | 5 |
| 1500 | 5 | 6 | 7 | 5 | 6 | 5 | 7 | 7 | 18 | 10 | 4 | 12 | 23 | 25 | 17 | 5 | 5 | 6 | 6 | 5 |
| 1600 | 5 | 10 | 5 | 5 | 4 | 5 | 7 | 8 | 7 | 12 | 11 | 11 | 6 | 7 | 7 | 10 | 7 | 8 | 9 | |
| 1700 | 9 | 8 | 5 | 8 | 9 | 8 | 10 | 11 | 12 | 15 | 17 | 18 | 6 | 17 | 15 | 8 | 8 | 5 | 7 | 10 |
| 1800 | 8 | 8 | 7 | 7 | 6 | 8 | 8 | 7 | 8 | 6 | 15 | 12 | 7 | 6 | 5 | 8 | 7 | 20 | 10 | 10 |
| 1900 | 9 | 15 | 21 | 14 | 9 | 8 | 10 | 16 | 9 | 10 | 8 | 8 | 7 | 7 | 9 | 8 | 6 | 10 | 8 | 8 |
| 2000 | 9 | 12 | 12 | 27 | 18 | 10 | 10 | 11 | 11 | 8 | 11 | 9 | 24 | 11 | 7 | 5 | 6 | 5 | 5 | 6 |
| 2100 | 6 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 7 | 7 | 6 | 5 | 4 | 4 | 4 | 4 | 5 | 4 |
| 2200 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 7 | 8 | 9 | 9 | 10 | 17 | 10 | 11 | 10 | 16 | 14 |
| 2300 | 15 | 15 | 16 | 18 | 20 | 18 | 8 | 22 | 21 | 27 | 21 | 10 | 7 | 7 | 5 | 7 | 6 | 7 | 6 | 7 |
| 2400 | 8 | 6 | 7 | 8 | 13 | 10 | 6 | 5 | 4 | 6 | 5 | 8 | 10 | 8 | 7 | 6 | 6 | 4 | 4 | 4 |
| 2500 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 8 | 14 | 11 | 9 | 10 | 8 | 8 | 12 | 11 | 13 | 20 | 15 | 9 |
| 2600 | 10 | 11 | 15 | 17 | 18 | 13 | 17 | 15 | 15 | 13 | 15 | 17 | 8 | 6 | 9 | 16 | 16 | 12 | 11 | 12 |
| 2700 | 11 | 13 | 16 | 20 | 11 | 8 | 7 | 9 | 10 | 10 | 8 | 11 | 15 | 17 | 11 | 10 | 15 | 10 | 9 | 12 |
| 2800 | 12 | 7 | 11 | 7 | 10 | 10 | 9 | 8 | 8 | 8 | 6 | 13 | 12 | 15 | 13 | 18 | 11 | 15 | 20 | 17 |
| 2900 | 15 | 13 | 15 | 17 | 13 | 14 | 10 | 11 | 19 | 20 | 19 | 13 | 14 | 10 | 10 | 7 | 9 | 15 | 9 | 13 |
| 3000 | 13 | 7 | 10 | 8 | 10 | 10 | 11 | 11 | 11 | 10 | 7 | 6 | 13 | 8 | 9 | 9 | 10 | 10 | 16 | 12 |
| 3100 | 9 | 10 | 9 | 12 | 12 | 13 | 14 | 11 | 9 | 12 | 12 | 8 | 10 | 12 | 12 | 10 | 15 | 16 | 17 | 15 |
| 3200 | 15 | 21 | 13 | 9 | 10 | 6 | 7 | 8 | 14 | 15 | 17 | 24 | 22 | 25 | 26 | 15 | 17 | 16 | 15 | 11 |
| 3300 | 10 | 9 | 8 | 10 | 10 | 10 | 8 | 9 | 13 | 17 | 15 | 15 | 25 | 17 | 16 | 9 | 10 | 5 | 5 | 5 |
| 3400 | 7 | 8 | 10 | 13 | 16 | 15 | 15 | 15 | 15 | 14 | 19 | 22 | 24 | 22 | 17 | 12 | 11 | 20 | 33 | 14 |
| 3500 | 18 | 18 | 10 | 11 | 15 | 15 | 15 | 18 | 6 | 12 | 5 | 5 | 8 | 21 | 18 | 9 | 10 | 21 | 32 | 19 |
| 3600 | 17 | 23 | 27 | 11 | 7 | 9 | 18 | 17 | 8 | 19 | 19 | 12 | 10 | 13 | 14 | 12 | 17 | 23 | 34 | 24 |
| 3700 | 26 | 19 | 25 | 46 | 27 | 10 | 10 | 14 | 16 | 13 | 10 | 7 | 12 | 16 | 12 | 11 | 11 | 11 | 14 | 17 |
| 3800 | 13 | 13 | 14 | 14 | 13 | 15 | 11 | 10 | 11 | 11 | 26 | 17 | 10 | 10 | 19 | 10 | 12 | 12 | 12 | 24 |
| 3900 | 23 | 27 | 32 | 24 | 26 | 13 | 13 | 12 | 6 | 15 | 15 | 38 | 29 | 25 | 28 | 13 | 25 | 35 | 29 | 40 |
| 4000 | 28 | 20 | 57 | 28 | 14 | 20 | 16 | 28 | 22 | 19 | 16 | 23 | 16 | 13 | 21 | 18 | 20 | 17 | 11 | 15 |
| 4100 | 19 | 22 | 18 | 11 | 27 | 27 | 17 | 22 | 25 | 28 | 22 | 25 | 22 | 21 | 25 | 25 | 30 | 31 | 28 | 21 |
| 4200 | 24 | 23 | 22 | 25 | 30 | 31 | 30 | 32 | 14 | 10 | 8 | 9 | 11 | 16 | 14 | 9 | 8 | 8 | 9 | 11 |
| 4300 | 16 | 12 | 12 | 9 | 10 | 12 | 6 | 14 | 11 | 11 | 16 | 13 | 12 | 21 | 21 | 17 | 24 | 23 | 24 | 24 |
| 4400 | 20 | 25 | 27 | 31 | 30 | 14 | 18 | 18 | 20 | 19 | 25 | 25 | 25 | 25 | 25 | 24 | 30 | 31 | 42 | 43 |

| | 05 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 00 |
|------|----|----|----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|
| 4500 | 44 | 47 | 39 | 49 | 28 | 18 | 24 | 21 | 17 | 19 | 17 | 23 | 23 | 27 | 23 | 24 | 30 | 30 | 29 | 29 |
| 4600 | 31 | 41 | 42 | 38 | 34 | 41 | 38 | 43 | 17 | 25 | 21 | 14 | 14 | 12 | 13 | 12 | 12 | 13 | 13 | 14 |
| 4700 | 13 | 12 | 15 | 15 | 13 | 11 | 11 | 12 | 13 | 12 | 15 | 15 | 15 | 13 | 12 | 25 | 25 | 21 | 17 | 15 |
| 4800 | 15 | 11 | 13 | 13 | 15 | 13 | 10 | 11 | 16 | 16 | 15 | 9 | 12 | 15 | 15 | 12 | 11 | 10 | 15 | 14 |
| 4900 | 10 | 20 | 21 | 12 | 8 | 10 | 30 | 21 | 14 | 23 | 29 | 18 | 19 | 24 | 24 | 30 | 44 | 38 | 35 | 15 |
| 5000 | 3 | 5 | 9 | 12 | 12 | 19 | 12 | 13 | 28 | 84 | 41 | 29 | 29 | 30 | 23 | 21 | 22 | 22 | 17 | 18 |
| 5100 | 23 | 22 | 24 | 20 | 21 | 24 | 26 | 28 | — | — | — | 11 | 12 | 7 | 6 | 6 | 7 | 7 | 7 | 7 |
| 5200 | 7 | 7 | 7 | 9 | 13 | 16 | 16 | 17 | 18 | 16 | 18 | 17 | 16 | 17 | 27 | 32 | 35 | 30 | 20 | 21 |
| 5300 | 19 | 17 | 10 | 13 | 12 | 11 | 12 | 14 | 12 | 13 | 12 | 14 | 15 | 14 | 14 | 10 | 10 | 9 | 10 | 8 |
| 5400 | 8 | 9 | 11 | 10 | 12 | 11 | 12 | 10 | 10 | 11 | 12 | 11 | 12 | 13 | 14 | 11 | 11 | 13 | 13 | 15 |
| 5500 | 11 | 10 | 11 | 10 | 15 | 15 | 15 | 13 | 14 | 14 | 15 | 11 | 6 | 6 | 5 | 5 | 5 | 6 | 7 | 7 |
| 5600 | 5 | 7 | 9 | 9 | 9 | 10 | 11 | 12 | 11 | 11 | 11 | 10 | 10 | 12 | 13 | 13 | 13 | 12 | 12 | 12 |
| 5700 | 12 | 16 | 18 | 16 | 16 | 13 | 18 | 10 | 11 | 10 | 12 | 15 | 13 | 13 | 11 | 12 | 12 | 10 | 25 | 24 |
| 5800 | 21 | 30 | 31 | 9 | 10 | 15 | 13 | 9 | 10 | 15 | 19 | 22 | 24 | 27 | 24 | 32 | 28 | 27 | 34 | 38 |
| 5900 | 27 | 31 | 28 | 33 | 12 | 10 | 12 | 11 | 12 | 12 | 18 | 26 | 20 | 28 | 23 | 16 | 27 | 42 | 65 | 55 |
| 6000 | 11 | 28 | 35 | 36 | 9 | 24 | 32 | 23 | 22 | 17 | 13 | 14 | 12 | 14 | 14 | 15 | 8 | 10 | 15 | 27 |
| 6100 | 30 | 38 | 41 | 28 | 29 | 32 | 29 | 11 | 14 | 28 | 22 | 39 | 37 | 22 | 27 | 15 | 21 | 26 | 29 | 28 |
| 6200 | 19 | 21 | 19 | 15 | 20 | 27 | 34 | 46 | 35 | 37 | 31 | 33 | 26 | 17 | 14 | 16 | 26 | 29 | 10 | 22 |
| 6300 | 21 | 32 | 32 | 25 | 24 | 30 | 47 | 53 | 18 | 12 | 27 | 31 | 20 | 21 | 24 | 30 | 38 | 16 | 12 | 13 |
| 6400 | 17 | 32 | 35 | 39 | 34 | 25 | 25 | 17 | 30 | 23 | 26 | 26 | 37 | 31 | 46 | 36 | 50 | 30 | 45 | 35 |
| 6500 | 39 | 48 | 41 | 43 | 47 | 37 | 30 | 30 | 28 | 18 | 17 | 20 | 18 | 17 | 18 | 17 | 40 | 38 | 39 | 20 |
| 6600 | 21 | 40 | 35 | 68 | 66 | 68 | 52 | 43 | 53 | 29 | 33 | 45 | 40 | 37 | 43 | 55 | 43 | 36 | 24 | 50 |
| 6700 | 85 | — | — | 135 | 128 | 153 | 210 | 220 | 50 | 15 | 17 | 12 | 23 | 26 | 26 | 37 | 15 | 12 | 11 | 10 |
| 6800 | 14 | 12 | 16 | 18 | 17 | 18 | 17 | 17 | 20 | 20 | 19 | 17 | 18 | 13 | 20 | 13 | 13 | 15 | 16 | 16 |
| 6900 | 16 | 11 | 10 | 10 | 11 | 10 | 17 | 15 | 15 | 15 | | | | | | | | | | |