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WELL COMPLETION REPORT

JACK J. GRYNBERG
NO. 1-14 BLUEGRAVEL - VILLARD
SE/4 NE/4 SEC. 14 T9N-R91W
MOFFAT COUNTY, COLORADO

DVR	
FJP	
HHM	✓
JAM	✓
JJD	✓
GCH	
CGM	

Fee Lease: Book 374, Page 393, Moffat Co., Colorado

Geologic Supervision from 2000' to 4522'

file

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SUMMARY

OPERATOR: Jack J. Grynberg & Associates, 1050 - 17th Street,
Suite 1950, Denver, Colorado 80202 - (303) 572-1455

WELL DESIGNATION: No. 1-14 Bluegravel - Villard (Field extension well)

LOCATION: 2123' FNL, 788' FEL, SE/4 NE/4, Sec. 14, Twp. 9 North,
Rge. 91 West, Moffat County, Colorado

ELEVATIONS: 6603' ground, Kelly Bushing: 6613'

HOLE SIZE: 12 $\frac{1}{4}$ " surface hole to 286', 7-7/8" hole to 4531'

OBJECTIVE HORIZONS: Upper Cretaceous, Middle Lewis sands and the Blue-
gravel sand zone.

SURFACE CASING: Ran 13 joints of new and used 8-5/8" 20# casing
(total 284.30') landed at 284' K.B., cemented with
150 sacks class "G" cement, 2% CaCl and 3% salt
plus 1/4# flow seal per sack. Plug down at 3:00 a.m.,
January 16, 1975.

SPUD DATE: January 15, 1975, Midnight.

REACHED T.D. January 24, 1975.

WELL STATUS: Ran production string, \pm 4350', 4-1/2" casing
10.79# 8 round 1-26-75

TOTAL DEPTH 4522' Driller, 4531' E. Log.

DRILLING MUD: By Basin Mud Co., Vernal, Utah, Forrest Slater, Engr.

CORING: None

DRILL STEM TESTS: None - will test through production pipe

LOGGING SURVEYS: Dresser-Atlas Corp. Unit No. HL 6089, Roosevelt, Utah
Engineer: Mr. John Martin
Dual induction focused log 4529'-280'
Compensated Neutron-Comp. densilog-porosity 4493'-2700'
Compensated Densilog 4493'-2700'

CONTRACTOR: Superior Drilling Co., Rig No. 2, Mr. D. Saunders,
Toolpusher

GAS LOGGING UNIT: Unmanned portable, Continental Labs, Casper, Wyo.

DRILLING FOREMAN: Mr. Jack Gaines, Consultant, Farmington, New Mexico

WELLSITE GEOLOGIST: Ronald A. Janc, Consultant, 6946 West 14th Ave.,
Lakewood, Colorado

BIT RECORD & HOLE DEVIATION SURVEYS

No.	Mfgr.	Size	Type	Jets	Serial	Depth out	Foot-Hours age	WOB Run	1000#	RPM	# PP	Vert. Dev.
1S	Smith	12-1/4	DT-J	14 14 14	Re-run	286	286	12	10	180	700	0
1	S.T.C.	7-7/8	DS-J	14 14 14	TB-128	1145	859	11	25	160	600	1/4°
2	Hughes	7-7/8	OSC-3AJ	14 14 13	WW 648	1962	817	13-3/4	30	160	600	-
3	Reed	7-7/8	Y12-J	13 13 13	469028	2692	730	16-1/4	30	160	800	1 1/2°
4	S.T.C.	7-7/8	DT-J	13 13 13	BA 006	3493	801	22	30	160	800	1 1/2°
*5	Reed	7-7/8	Y-12	13 14 14	S22310	3832	339	14	35	120	800	1 1/4°
6**	Hughes	7-7/8	OSClG-J	13 12 12	DD 499	3852	20	1-1/4	35	120	800	-
7	Smith	7-7/8	DT-J	13 13 13	AZ-377	4075	223	11-3/4	35	120	850	-
8	Smith	7-7/8	DT-J	13 13 13	AZ-156	4364	289	11-1/2	35	120	850	-
9	Hughes	7-7/8	OSC-3A	14 14 13	DH-675	4522	158	3-1/2	35	100	850	-
TD												

* (#5) Lost 3 cones

** (#6) Drilling on junk

MUD RECORD

Date	Depth	Weight	Viscosity	Filtrate	Filter Cake	P.H.
1-15-75	Drilling with water - wt. 9.5, Vis. 50					
1-16-75	Drilling with water					
1-17-75	Drilling with water					
1-18-75	Mud up at 1962' - drilling with water					
1-19-75	2231'	9.5		7	2/32	10
1-20-75	3469'	10.0	31	10.6	3/32	10
1-21-75	3690'	10.1	43	8.8	3/32	10.5
1-22-75	3850'	9.8	34	9.0	3/32	10.0
1-23-75	4360'	10.1	50	16.0	4/32	9.5
1-24-75	4522'	9.9	47			

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14-9N-7W

GEOLOGICAL FORMATION TOPS

<u>Formation</u>	<u>Depth</u>	<u>Subsea datum (K.B.)</u>
Brown's Park	surface	
Fort Union	1270'	+5343'
Lance	2630'	+3983'
Lewis Shale	3648'	+2965'
Upper Lewis "A" sd. zone	3958'	+2655'
Bluegravel sd. zone	4130'	+2483'
Base Bluegravel sd. zone	4316'	+2297'
Total depth: driller	4522'	E. Log 4531'

Quantitative log interpretation - porosity zones
By Mr. John Martin, engineer Dresser-Atlas Corp.

<u>Point No.</u>	<u>Formation</u>	<u>Depth</u>	<u>No. Feet</u>	<u>Aggregate</u>	<u>ØD</u>	<u>Rw</u>	<u>Rt</u>	<u>S.W.</u>
1	Lance	3346-3348	(2')		14	.2	23	61%
2	Lance	3396-3414	(18')	50'	16	.2	22	54%
3	Lance	3428-3452	(24')	Possible	17	.2	21	52%
4	Lance	3456-3462	(6')	Gas	17	.2	21	52%
5	Fox Hills(?) sd.	3578-3582	(4')	8'	17	.2	12	68%
6	Fox Hills(?) sd.	3608-3612	(4')	Marginal	15	.2	14	72%
7	Lewis "A" sd.	3960-3964	(4')		12	.2	14	91%
8	Lewis "A" sd.	3970-3981	(11')	24'	14	.2	8	100%
9	Lewis "A" sd.	4024-4030	(6')	wet	12	.2	10	100%
10	Lewis "A" sd.	4043-4046	(3')		11	.2	9	100%
11	Bluegravel sd.	4234-4246	(12')	14'	11	.2	15	96%
12	Bluegravel sd.	4252-4254	(2')	wet	13	.2	15	81%

Pma = 2.65
Pf = 1.0

Rm = .65 @86
RMF = .49 @86

B.H.T. = 104°

DRILLING RECORD

- 1-11-75 Moving in rig, began rigging up at 8:00 a.m.
- 1-12-75 Rigging up. Bad weather.
- 1-13-75 Rigging up. Snow, very cold.
- 1-14-75 Rigging up. Fired boiler, thawing mud lines, mixing mud.
- 1-15-75 Dug rat and mouse holes, spudded in at 4:00 a.m., drilled 0 - 286'.
- 1-16-75 Repair light plant, ran surface casing, 13 joints of used 8-5/8" (Lone Star) 20# casing, landed at 284', cemented with 150 sacks class "G" cement, 3% salt and 2% CaCl, plus 1/2# flow seal per sack cement. Plug down @ 3:00 a.m., W.O.C. 12 hours, nipples up. Pressure tested casing, blind rams and manifold @ 1000# for 15 min. Tested pipe rams and hydrill @ 1000# for 15 min., all o.k. Top of cement @ 260'.
- 1-17-75 Drilled 286' to 1145'. Bit plugged twice, trip for Bit No. 2 @ 1145'.
- 1-18-75 Drilled 1145' to 2119'. Trip for Bit No. 3 @ 1962' - adjusted brakes.
- 1-19-75 Drilled 2119' to 2952'. Worked on pump and light plant. Trip for Bit No. 4 @ 2692'.
- 1-20-75 Drilled 2952' to 3493'. Light plant failed, replaced with auxilliary light plant. Cleaned pits, trip for Bit No. 5 @ 3493'.
- 1-21-75 Drilled 3493' to 3832'. Tight hole, drillstring sticking while making connections. Discovered hole in drill pipe, 6 stands in. Trip for Bit No. 6 @ 3832'. Pulled Bit No. 5 (Reed Y-12) lost all three cones. Went in with junk sub and Bit #6 (OSC-1G).
- 1-22-75 Drilled 3832' to 4075'. Trip for Bit No. 7 @ 3852' after drilling on junk. Recovered more than 1 pint of bearings and fragments, cones evidently worked into sidewall.
- 1-23-75 Drilled 4075' to 4355'. Trip for Bit No. 8 @ 4075'. Checked B.O.P.'s stuck drillstring while making connection @ 4260', worked loose.

- 1-24-75 Drilled 4355' to 4522' T.D. Trip for Bit No. 9 @ 4364'. Reached T.D. @ 12:30 p.m. Made short trip (11 stands) circulated and conditioned mud to log. Trip out to log - logging at 8:00 p.m.
- 1-25-75 T.D. 4522'. Finished logging @ 8:00 a.m., telecopied logs, wait on orders to run production string - waiting on cementers, pipe at location.
- 1-26-75 Ran 4350' of 4-1/2" 10.75 No. 8 round line pipe, cement 2 stage. #1 to 3900', #2 from 3650' to 3200'.

GEOLOGICAL SUMMARY

The Jack Grynberg and Associates No. 1-14 Villard-Bluegravel test represents the most recent attempt to extend the Bluegravel gas pool in the northern direction. The primary objective zones in this test were those from which gas production is obtained in the Bluegravel pool, the Lewis "A" and Bluegravel sandstone zones.

The 1-14 Villard penetrated the above horizons and reached total depth 4522' on January 24, 1975. The sandstones in these objective zones were poorly developed, and such porosity zones as were present, indicated very high water saturations, as well as being in an unfavorably low subsurface structural position relative to two of the nearest producing wells in the pool. The Lewis "A" and the Bluegravel sandstone zones therefore appear to be devoid of commercial gas producing potential. (See porosity zone evaluations).

The quantitative log interpretation of the porosity zones also disclosed a concentration of favorable porosity in the overlying Lance Formation in the depth interval from 3346'-48' and 3396'-3462' having an aggregate of 50 feet of potential gas producing sand. The Continental Laboratories gas monitor recorded a moderate increase in background gas while penetrating this zone, with maximum gas peaks of 200 units from 3450' and 150 units from about 3474', however, the maximum concentration of white, very fine grained, glauconitic and largely clay filled sandstone did not exceed 10% of the sample tray volume.

The above interval (3396'-3464') was not drillstem tested owing to the lack of suitable straddle packer seats. The caliper log indicates hole washout above the zone (in coal) to be in excess of 10 inches, while below the zone, in a soft plastic bentonite, washout also indicates 10 inches.

The operator accordingly elected to run production string, cemented in two stages, and will test through pipe at a later date, which affords better weather and road conditions.

The subsurface structural comparison of the 1-14 Villard-Bluegravel with two of the nearest pool wells, on the tops of the Lewis "A" and the Bluegravel sandstone zones, is shown as follows:

1-14 Villard	1-24 Fed. Bluegravel	No. 3 Cottonwood Gulch
SE NE 14-T9N-R91W	NE SE 24-T9N-R91W	SE NE 23-T9N-R91W

	<u>1-14 Villard</u>	<u>1-24 Fed. Bluegravel</u>	<u>No. 3 Cottonwood Gulch</u>
Subsea K.B.			
Lewis "A" sd.	+2655'	+2790'	+2714'
Bluegravel sd.	+2483'	+2638'	+2534'

The Lewis "A" sand in the 1-14 Villard is 59' structurally lower than in No. 3 Cottonwood Gulch.

The Bluegravel sand in the 1-14 Villard is 51' structurally lower than in No. 3 Cottonwood Gulch.

The Lewis "A" sand in the 1-14 Villard is 135' structurally lower than in 1-24 Bluegravel-Fed.

The Bluegravel sand in the 1-14 Villard is 55' structurally lower than in 1-24 Bluegravel-Fed.

Respectfully submitted,

Ronald A. Janc

Ronald A. Janc

SAMPLE DESCRIPTIONS

The samples were examined wet, and were not adjusted to mechanical logs. The intervals are as noted.

Sample quality: fair.

The samples have been filed with the American Stratigraphic Company at Denver, Colorado.

Sample intervals: 0-2000' = 30' samples, 2000'-4510' = 10' samples, 0-455' = no samples.

455- 485	Sandstone, medium green, unconsolidated, clear, angular.
485- 515	No samples.
515- 665	Shale, light grey-green-grey blocky with streaks silty shale.
665- 785	Sandstone, coarse, unconsolidated, conglomeratic, clear, ang-sub. rdd.
785- 815	Shale, light grey and green grey, blocky.
815- 905	Sandstone, coarse, unconsolidated, as above.
905-1145	Shale, light grey to greenish grey, blocky, some purple, partly silty.
1145-1175	Sandstone, coarse, conglomeratic, unconsolidated, clear to milky, ang. to sub. rdd.
1175-1825	Shale, light grey and light green-grey, blocky, grading to brown-grey sandy, sharp grading to silty, with minute carbonaceous inclusions.
1825-1885	Coal, vitreous, conchoidal, sub-bituminous, clean.
1885-2000	Shale, light grey, green-grey, brown grey, blocky, uniform with occasional streaks coal.
10' samples:	2000' to 4522' Began mudding up.
2000-2010	Shale, as above, with coal.
2010-2030	Coal, vitreous, sub-bituminous, some shale as above, trace glauc. sand.
2030-2100	Shale, light grey and brown-grey, blocky, with thin glauconitic sand.
2100-2110	No samples.

- 2110-2210 Shale, light grey, brown-grey, and green-grey, blocky, part silty, with occasional streaks of coal.
- 2210-2240 No samples.
- 2240-2260 Sandstone, coarse, conglomeratic, unconsolidated, ang-sub-rdd., clear to milky.
- 2260-2280 No samples - probably sand as above.
- 2280-2290 Sandstone, as above.
- 2290-2320 Shale, light grey and green-grey, blocky, part silty, with carbonaceous inclusions and trace coal.
- 2320-2400 Sandstone, coarse, conglomeratic, unconsolidated, clear to milky, ang to sub rdd.
- 2400-2430 Shale, light grey, green-grey and brown-grey, with carbonaceous inclusions, blocky with streaks coal.
- 2430-2480 Shale, as above, becoming silty and carbonaceous with coal laminae.
- 2480-2520 Sandstone, coarse, unconsolidated, ang to sub rdd., clear to milky.
- 2520-2570 No samples - lost plug.
- 2570-2650 Shale, light grey, brown-grey and green-grey, blocky, part silty, carbonaceous, with streaks coal and traces white very fine grained sandstone.

Land Formation @ 2630'

- 2650-2800 Shale, as above, with streaks dark grey carbonaceous gassy shale, occasional streaks coal and coaly shale, some siltstone.
- 2800-2840 Shale, as above, with coal, also much loose unconsolidated, coarse sandstone.
- 2840-2880 Shale, dark grey, very carbonaceous, coal streaks, some siltstone.
- 2880-2900 Coal, vitreous, clean, with vicarb shale, as above.
- 2900-3190 Shale, medium grey, brownish and greenish-grey, blocky, also much dark grey very carbonaceous and platy shale, partly silty with alternating thin streaks coal and traces thin white glauconitic sand, very tight.
- 3190-3200 Coal, with shale, as above.

- 3200-3210 Shale, as above, with much coal.
- 3210-3220 Coal, vitreous, sub-bituminous with shale, as above.
- 3220-3300 Shale, medium grey, brown and green, blocky interbedded with dark grey platy, carbonaceous shale and coal streaks.
- 3300-3310 Poor sample, soft plastic bentonitic shale (fireclay?)
- 3310-3340 Siltstone, brownish-tan with shale, as above.
- 3340-3370 Shale, medium grey, brown-grey and tan, trace white clay filled sandstone, some dark grey very carbonaceous shale and coal.
- 3370-3400 Coal, sub-bituminous, vitreous, clean, some shale as above.
- 3400-3410 Shale, bentonitic, very soft, plastic.
- 3410-3480 Shale, medium grey, brown and green-grey, blocky, with tan siltstone, streaks coal, and some white sandstone, glauconitic fine grained clay filled, no visible shows - gas kick @ 3450 = 200 units strong gas kick at 3383 (off scale) estimated at 260 units background gas increase thereafter to about 3470', dropping off thereafter.
- 3480-3500 Shale, bentonitic, soft, plastic, with tan mudstone and shale as above.
- 3500-3530 No samples, intervals caught, but mostly gel like mud.
- 3530-3540 Bentonitic shale, tan-grey, very soft.
- 3540-3560 Shale, medium grey, green and brown-grey, blocky, also dark grey, very carbonaceous shale, platy, traces coal and sandstone, very fine grained, glauconitic.
- 3560-3570 Lithology as above with much soft bentonite.
- 3570-3580 No sample in bag - probably bentonite.
- 3580-3600 Shale, medium grey, blocky, splintery some light grey and green-grey, trace coal.
- 3600-3610 Shale, light tan grey, very bentonitic, plastic.
- 3610-3650 Shale, medium grey, brown-grey and green-grey, blocky, partly silty, with dark grey platy very carbonaceous shale and coal streaks, some grey siltstone.

Lewis shale @ 3648'

- 3650-3690 Shale, as above with increase in grey and white siltstone laminae.
- 3690-3710 Siltstone, light grey and tan grey with some sandstone white very fine grained silty and tight.
- 3710-3810 Shale, medium grey and green-grey, blocky, partly silty with loose coarse quartz pebbles and tan siltstone.
- 3810-3820 Shale, etc., as above, with traces coal and bit fragments.
- 3820-3830 Shale, medium grey, green and brown, blocky, partly silty also dark grey and coal.
- 2830-3860 Shale, as above, with dark grey finely micaceous splintery shale, uniform, also sandstone, white, very fine grained tightly clay filled, no show, background gas ± 20 units.
- 3860-3960 Shale, dark grey, platy-splintery, finely micaceous uniform with occasional thin streaks of coal and siltstone, traces chert pebbles.
- 3958' Lewis "A" sandstone
- 3960-4010 Sandstone, white, very fine grained, glauconitic, clay filled tight, no visible shows, slight background gas increase to about 30 units. Uphole circulation time is 47 minutes.
- 4010-4030 Shale, medium dark grey, carbonaceous, silty with siltstone and some sandstone, very fine grained clay filled with carbonaceous inclusions, trace loose sand and wh. anhyd.
- 4030-4050 Sandstone, white, very fine grained clay filled with shale inclusions, tight. No shows, also some shale, as above.
- 4050-4130 Shale, light grey to green grey, blocky, partly silty, some grey siltstone.
- 4130-4190 Shale, as above, fast drilling break from 4137-63, gas peak to 80 units.
- 4190-4220 Shale, dark grey, carbonaceous, platy, (bleeding gas) some coal with trace sandstone, medium-fine grained, white glau. clay filled tight. Highest ratio of sand to shale, only 10%.
- 4220-4230 Shale, etc., as above, with increase in sandstone, clear, very fine grained, rounded friable, with fair p. & p., no visible shows. Background gas about 60 units. Heavy gas kick, off scale (IX) setting when pipe stuck.

- 4230-4280 Shale, dark grey, carbonaceous splintery, with shale, as above, partly silty with thin sandstone lenses and 5% sandstone white to clear, very fine grained very friable, good p & p where otherwise not clay filled. No visible shows. Background gas about 60 units with peaks to 130 units.
- 4280-4320 Lithology much as above, with sandstone grading to siltstone, some loose unconsolidated very fine grained sand grains. No visible shows. Background gas dropping back to 40-60 units.
- 4316 Base of Bluegravel sandstone zone.
- 4320-4400 Shale, medium to dark grey, very carbonaceous, splintery, to soft and sooty, partly silty also some shale, medium grey-green-grey, blocky, silty.
- 4400-4470 Shale, dark grey to black, carbonaceous, finely micaceous, uniform with streaks grey siltstone and shell fragments.
- 4470-4522 Shale, dark grey to black, very carbonaceous, splintery, soft with traces shell fragments.

T.D. 4522' @ 1:00 p.m. January 24, 1975.