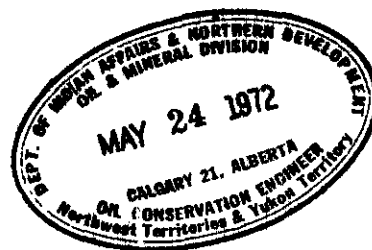


WELL SUMMARY & SAMPLE DESCRIPTION

ARCO WEST WHITEFISH RIVER H-34

Atlantic Richfield Canada Ltd.
M. S. Shawa & G. R. Turnquist
Geologists
April, 1972



Fred G. Rayer

F. G. Rayer P. Geol.
District Geologist

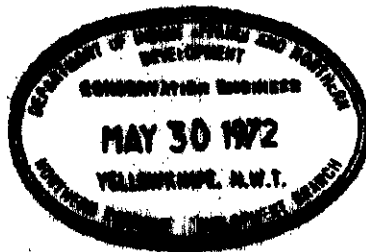


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SECTION I - SUMMARY OF WELL DATA

(a) WELL NAME AND NUMBER

ARCO West Whitefish River H-34

(b) PERMITTEE

Atlantic Richfield Canada Ltd.

(c) NAME OF OPERATOR

Atlantic Richfield Canada Ltd.
650 Guinness House, 727 - 7th Avenue S.W.,
Calgary, Alberta

(d) LOCATION

Unit H, Section 34, Grid 65°40'N, 124°30'W
Latitude 65°33'24"N, Longitude 124°35'45"W
Unique Well Identifier 300H346540124300
Universal Well Location Reference - 65.5567°N, 124.5958W.

(e) PERMIT NUMBER

4991

(f) DRILLING CONTRACTOR

Tri-City Drilling (1968) Ltd., Rig #2

(g) DRILLING AUTHORITY

No. 536

(h) CLASSIFICATION

Wildcat

(i) ELEVATION

Ground Elevation 745' (from shot point 640) K.B. Elevation 757'

(j) DATE SPUDDED

March 14, 1972 (12:01 a.m.)

(k) DATE COMPLETED DRILLING

April 8, 1972 (6:25 p.m.)

(l) TOTAL DEPTH AND PLUGGED BACK TOTAL DEPTH

TD 5428'; PBTD Surface

(m) WELL STATUS

Dry and Abandoned

(n) DATE RIG RELEASED

April 13, 1972 (1:00 a.m.)

(o) HOLE SIZE

Surface	17 1/2"	from surface to 155'
	12 1/4"	from 155' - 670'
	8 3/4"	from 670' - 5428'

(p) CASING

(Surface) 9 5/8" to 660' with 415 sacks permafrost cement.

SECTION II - GEOLOGICAL SUMMARY

(a) Formation Tops

<u>Formation</u>	<u>Sample</u>	<u>Log</u>
Quaternary	0	
Cretaceous	330	
Basal Cretaceous Sand	2212	2222
Devonian		
Hume	2480	2505
Bear Rock	2730	2724
Siluro-Ordovician		
Mount Kindle	3940	3960
Cambrian	5015	4994
Sand	5287	² 5496
Porosity	5310	5315
Precambrian	5411 (-4653)	5411

(b) Cored Intervals

Core No. 1 2278 - 2312' (Lower Cretaceous)

Core No. 2 2471 - 2531' (Basal Cretaceous - Hume)

Sidewall Cores

820', 915', 980', 1040', 1150', 1200', 1306', 1500',

1710', 1846', 2110', 2090', 2230', 2390'

(c) Core Description

Sidewall Cores:

820' Sandstone - clear, quartzose, very fine grain, friable, subangular, poor to moderate sorting, 5% dark minerals, 2-3% glauconite grains.

915' Sandstone - clear, quartzose, friable, very fine grain, subangular, poor to moderate sorting, slightly calcareous, 2-3% dark material (carbonaceous? pyrobitumen (?), 1% glauconite grains.

980' Sandstone - clear, quartzose, very fine grain, subangular, moderate sorting, slightly calcareous, 5% dark material (carbonaceous, pyrobitumen, mica flakes), dark material occurs as discrete laminae and also scattered in sample, 2-3% glauconite, porous.

1040' Sandstone - clear, quartzose, friable, very fine grain, (.08 - .06), subangular - angular, moderate sorting, 3-5% dark material as above, 1% glauconite, porous.

1150' Sandstone - clear, quartzose, friable, very fine grain, (.1mm) subangular, moderate sorting, 2-3% dark material, 2% glauconite grains, porous, shale laminae.

1200' Sandstone with thin dark shale laminations. Sandstone - quartzose, friable, very fine grain, subangular, poorly sorted, 5-10% dark material, 1% glauconite, calcite cement, porous.

- 1306' Silty mudstone - dark.
- 1500' Sandstone - clear, friable, quartzose, very fine grain, (.06 - .08) subangular - subround, moderate sorting, 5% dark material, 1% glauconite, good porosity.
- 1710' Silty mudstone-shale - dark, blocky.
- 1846' No core.
- 2110' Shaly siltstone - silty shale - dark grey, very argillaceous, calcareous.
- 2090' Dark-grey, silty, blocky, mudstone.
- 2230' Dark grey mudstone with sandstone laminae. Sandstone - quartzose, very fine grain - to - silt, 10-15% dark minerals.
- 2390' Siltstone to very fine grain sandstone - clear grains, poorly sorty, argillaceous, calcareous, 1-2% glauconite.

Core No. 1: 2278 - 2312' (Recovered 25.2') Orientated Core.

2278 - 2312' Dark grey shale, fissile, and grey siltstone with micro ripples throughout, burrowed.

<u>Depth</u>	<u>Min./Foot</u>
2278 - 2279'	13
2279 - 2280'	12
2280 - 2281'	8
2281 - 2282'	7
2282 - 2283'	7
2283 - 2284'	7
2284 - 2285'	9
2285 - 2286'	9
2286 - 2287'	9
2287 - 2288'	8
2288 - 2289'	10
2289 - 2290'	8
2290 - 2291'	9
2291 - 2292'	10
2292 - 2293'	10
2293 - 2294'	9
2294 - 2295'	11
2295 - 2296'	9
2296 - 2297'	10
2297 - 2298'	9

<u>Depth</u>	<u>Min./Foot</u>
2298 - 2299'	8
2299 - 2300'	10
2300 - 2301'	9
2301 - 2302'	9
2302 - 2303'	9
2303 - 2304'	9
2304 - 2305'	8
2305 - 2306'	10
2306 - 2307'	12
2307 - 2308'	10
2308 - 2309'	12
2309 - 2310'	10
2310 - 2311'	10
2311 - 2312'	10

Core No. 2: 2471 - 2531' (Recovered 60')

2471 - 2472'	Light grey sandstone, slightly glauconitic, moderate to poor sorting, medium to fine grained.
2472 - 2485'	Light grey sandstone, moderate sorting, slightly glauconitic, very fine grained.
2485 - 2494'	As above except fractured and parallel lamination in places.
2494 - 2500'	Light grey sandstone, moderate - poor sorting, minor dark minerals. Medium to fine grained.
2500	Top of unconformity.
2500 - 2501'	Dark grey shale, fissile.
2501 - 2516'	Grey-brown pelmicrite. Limestone is brecciated throughout the interval in horizons or possibly these are intraclasts. Tight.
2516 - 2521'	Brown pelmicrite, white sparite crystal infill. Tight.
2521 - 2525'	Dark brown micrite, ostracod and microfauna. Tight.
2525 - 2531'	Grey-brown micrite. Tight.

<u>Depth</u>	<u>Min. /Foot</u>
2471 - 2472'	9
2472 - 2473'	6
2473 - 2474'	9
2474 - 2475'	8
2475 - 2476'	7
2476 - 2477'	7
2477 - 2478'	7
2478 - 2479'	7
2479 - 2480'	8
2480 - 2481'	7
2481 - 2482'	6
2482 - 2483'	7
2483 - 2484'	7
2484 - 2485'	8
2485 - 2486'	6
2486 - 2487'	6
2487 - 2488'	7
2488 - 2489'	5
2489 - 2490'	5
2490 - 2491'	6
2491 - 2492'	10
2492 - 2493'	5
2493 - 2494'	7
2494 - 2495'	4
2495 - 2496'	7
2496 - 2497'	5
2497 - 2498'	6
2498 - 2499'	6
2499 - 2500'	7
2500 - 2501'	6
2501 - 2502'	8
2502 - 2503'	10
2503 - 2504'	11
2504 - 2505'	12
2505 - 2506'	9
2506 - 2507'	11
2507 - 2508'	10
2508 - 2509'	10
2509 - 2510'	10
2510 - 2511'	9
2511 - 2512'	11
2512 - 2513'	10
2513 - 2514'	9
2514 - 2514'	9
2515 - 2516'	8
2516 - 2517'	9
2517 - 2518'	8
2518 - 2519'	10

<u>Depth</u>	<u>Min./Foot</u>
2519 - 2520'	10
2520 - 2521'	11
2521 - 2522'	12
2522 - 2523'	11
2523 - 2524'	10
2524 - 2525'	9
2525 - 2526'	10
2526 - 2527'	11
2527 - 2528'	9
2528 - 2529'	9
2529 - 2530'	9
2530 - 2531'	9

(d) Sample Description

100	-	160'	Dark grey clay and pebbles fragments and sandstone, very coarse siltstone and shale.
160	-	190'	No samples.
190	-	210'	Round very fine sandstone and coarse grained sandstone.
210	-	340'	No samples.
340	-	400'	Grey sandstone medium grained, glauconitic, good porosity, moderate sorting.
400	-	440'	No samples, lost circulation at 414'.
440	-	450'	Dark grey siltstone and fine grained sandstone glauconite.
450	-	530'	No samples.
520	-	540'	Grey sandstone, glauconite, medium grained, siltstone, moderate porosity.
540	-	590'	No samples.
590	-	650'	Grey sandstone, glauconite fine grained low porosity.
650	-	730'	No samples.
730	-	740'	Sandstone grey glauconite, moderate sorting sandstone, low porosity.
740	-	830'	No samples.
830	-	840'	Sandstone grey, glauconite, moderate sorting, low porosity.
840	-	910'	No samples.
910	-	920'	Grey sandstone, glauconitic, moderate sorting, low porosity.
920	-	1090'	No samples.
1090	-	1170'	Light grey sandstone, moderate porosity, moderate sorting, glauconitic, fine grained.
1170	-	1230'	Grey siltstone and grey sandstone glauconite, very fine grained.

1230	-	1390'	Dark grey shale and grey siltstone glauconite.
1390	-	1560'	Light grey very coarse sandstone, glauconite, moderate sorting low porosity interbedded with dark grey shale.
1560	-	2080'	Dark grey shale, silty pyritic, fissile.
2080	-	2210'	Grey siltstone glauconite interbedded with dark grey shale.
2210	-	2278'	Light grey sandstone, silty glauconite, low porosity, very fine grained, moderate sorting.
2278	-	2312'	Core #1.
2312	-	2460'	Light grey sandstone fine grained, moderate sorting interbedded with dark grey fissile shale.
2460	-	2471'	Quartz sandstone, moderate sorting, very good porosity.
2471	-	2531'	Core #2.
2531	-	2730'	Brown pelletal limestone interbedded with cream dolomicrite, low porosity.
2730	-	3010'	Cream brown anhydrite with minor stringers of minor shale white cream dolomicrite.
3010	-	3200'	Light brown dolosparite, dolomicrite with minor cream light anhydrite, minor shale.
3200	-	3250'	Brown micrite trace anhydrite.
3250	-	3320'	Light brown microdolosparite, minor shale.
3320	-	3390'	Light brown cream dolomicrite and anhydrite, some marl.
3390	-	3630'	Red dolomicrite, some red sandstone and siltstone, light brown dolomicrite and dark grey shale.
3630	-	3940'	Red and white dolomicrite and dolomicrospar interbedded with thin stringers of siltstone and shale very tight.
3940	-	4230'	Light grey dolomicrite and arenite silty pyritic with minor dark grey shale clear dolomite white crystals infill, green shale partings, tight.
4230	-	4400'	Same as above with minor chert light brown and brown, tight.
4400	-	4560'	Light grey dolospar with pale green shale partings minor shale, tight.

- 4560 - 4590' Dolomite light grey brown microcrystalline to crypto-crystalline, slightly pyritic, trace light green shale no visible porosity.
- 4590 - 4600' Dolomite as above.
- 4600 - 4610' Dolomite as above, trace dolomite microcrystalline light-medium brown.
- 4610 - 4620' Dolomite light grey microcrystalline to medium crystalline slightly pyritic, trace possible vug, no cut stain odor fluorescence.
- 4620 - 4630' Dolomite light grey microcrystalline to medium crystalline, slightly pyritic, trace possible vug no cut, stain, odor, fluorescence.
Began losing some mud at 4640 and lost circulation at 4645 (est. 75 bbls.).
- 4630 - 4650' Dolomite white microcrystalline to medium crystalline, trace crystalline porosity and dead oil stain, scattered dolomite, light brown microcrystalline to fine crystalline, tight, trace shale light green, silty, no cut, odor, fluorescence.
- 4650 - 4660' Dolomite white to very pale green microcrystalline to medium crystalline, trace green shale interclasts, tight, scattered clear crystal gypsum? scattered pyrite.
- 4660 - 4670' Dolomite white sucrosic fine crystalline trace clear crystal as above, no visible porosity, scattered dolomite light brown fine crystalline.
- 4670 - 4680' Dolomite as above, trace medium crystalline, trace green shale no cut stain, odor, fluorescence.
- 4680 - 4690' Slight drilling break at 4686'.
Dolomite white to pale green, cryptocrystalline to medium crystalline, sucrosic in part, abundant clear crystal (gypsum?) scattered dolomite light brown microcrystalline, no cut, stain, odor, fluorescence, (possible gypsum filled vugs?) no visible crystalline porosity.
- 4690 - 4700' Dolomite white to pale green to light grey micro-crystalline to medium crystalline, scattered brown medium crystalline dolomite scattered crystals (gypsum).
- 4700 - 4780' Dolomite white to pale green, cryptocrystalline to medium crystalline, no visible porosity, scattered red argillaceous silty dolomite, scattered shale pale green dolomite.

- 4780 - 4800' Dolomite light-medium brown to white, cryptocrystalline to medium crystalline, trace vug porosity with dead oil stain, no cut, odor, fluorescence, scattered green silty shale.
- 4800 - 4810' Dolomite light brown cryptocrystalline dense, tight.
- 4810 - 4830' Dolomite light to medium brown cryptocrystalline, dense, slightly silty, tight, slightly pyritic, scattered green silty shale, slightly pyritic, trace red brown silty dolomite.
- 4830 - 4850' Dolomite light grey, silty, abundant dolomite as above, no visible porosity.
- 4850 - 4880' Dolomite, light grey to light brown, cryptocrystalline to fine crystalline, very silty, slightly pyritic, scattered shale pale green.
- 4880 - 4890' Dolomite light brown, cryptocrystalline, slightly pyritic, dense, scattered dolomite dark brown cryptocrystalline, dense, argillaceous.
- 4890 - 4920' Dolomite as above; 15% shale pale green silty pyrite.
- 4920 - 4930' Dolomite light brown to white, cryptocrystalline, dense, scattered shale pale green.
- 4930 - 4940' Dolomite, light-medium brown, cryptocrystalline, dense.
- 4940 - 4990' Dolomite, medium to dark brown cryptocrystalline, dense, argillaceous, pyritic.
- 4990 - 5000' Dolomite as above, 20% dolomite grey - green, silty.
- 5000 - 5010' As above.

Top Cambrian 5015 (-4257)

- 5010 - 5020' Dolomite dark brown to medium grey cryptocrystalline argillaceous 10% dolomite light brown medium crystalline trace vuggy porosity. 25% siltstone red brown dolomite scattered green wavy shale, pyritic. No cut, stain, odor, fluorescence.
- 5020 - 5030' Siltstone and shale as above. 20% dolomite as above.
- 5030 - 5050' Shale red brown and green, silty, dolomitic, 20% siltstone, pink dolomitic.
- 5050 - 5060' Siltstone, light grey, dolomitic. 25% red and green shale as above.

- 5060 - 5080' Siltstone red-brown dolomite, 40% shale pale green, 10% siltstone light grey dolomite.
- 5080 - 5090' Shale, medium grey, green to brown slightly dolomitic. 15% shale pale green. 5% siltstone red-brown.
- 5090 - 5120' Dolomite grey to light brown cryptocrystalline, argillaceous. 10% red-brown siltstone and green shale.
Drilling break at 5123 to 5152'. - Indicated to be salt on BHC Sonic Log. 5120 - 5152' are interbeds in salt.
- 5120 - 5130' Siltstone red-brown dolomitic and shale pale green, sandstone light grey to white, very fine grained to siltstone, dolomitic friable, no visible porosity, trace perfect micro quartz crystal. No cut, stain, odor, fluorescence.
- 5130 - 5150' Sandstone light grey, very fine crystalline to siltstone, slightly dolomitic, anhydritic, fair to good crystalline porosity, friable, no cut, stain, odor, fluorescence, scattered clear quartz crystals, 40% siltstone shale and dolomite as above.
- 5150 - 5160' Siltstone grey brown, argillaceous, slightly dolomitic, 10% siltstone as above, scattered shale pale green.
- 5160 - 5190' Dolomite dark green brown, cryptocrystalline, dense, anhydritic, pyritic. 30% siltstone as above trace red brown siltstone and green shale.
- 5190 - 5200' As above, 10% dolomite red-brown, silty.
- 5200 - 5210' Dolomite as above, 25% siltstone red-brown, 10% shale pale green.
- 5210 - 5220' Siltstone red-brown, dolomitic, 20% dolomite as above, scattered grey green shale.
- 5220 - 5230' Siltstone light to medium grey-brown, dolomitic, argillaceous, 30% dolomite medium grey-brown, silty, pyritic.
- 5230 - 5260' Siltstone as above, trace shale pale green, 10% sandstone light grey-brown, very fine grained to siltstone at 5260', trace glauconite.
- 5260 - 5270' Sandstone, light grey, very fine grained to siltstone, hard, tight, subangular.
- 5270 - 5280' Siltstone, dark grey-brown, argillaceous. 20% sandstone as above.

Top Cambrian Sand 5287 - 4259'

- 5280 - 5290' Sandstone, light grey, very fine to fine grained, subangular, glauconitic, tight. 40% siltstone as above.
- 5290 - 5300' Sandstone, light grey to light brown, very fine to fine grained, subangular, moderate sorting, glauconitic, tight, anhydritic cement?
- 5300 - 5310'
- 5310 - 5340' Sandstone, clear, quartzose, very fine to coarse grained, subangular to subrounded, loose grains, probably fair to good porosity, trace glauconite, no cut, stain, odor, fluorescence.
- 5340 - 5350' Sandstone as above, trace shale green with round partings, silty.
- 5350 - 5360' Sandstone as above with 20% fine grained, tight, 25% anhydrite white with rust stains, very soft, scattered glauconite, trace green schist with feldspar.
- 5360 - 5370' Poor sample trip, mostly sand as above.
- 5370 - 90' Sandstone clear, rust stained in part, quartzose, fine to coarse grained, subangular to subround, fair to good porosity, 15% anhydrite white soft.
- 5390 - 5400' Sandstone clear and rust stained, fine to coarse grained, quartzose, loose grains, fair to good crystalline porosity, no cut, stain, odor, fluorescence.
- 5400 - 5410' Sandstone as above, scattered sandstone, brick red fine grained, argillaceous.

Top Precambrian 5411 (-4653)

- 5410 - 5420' Dolomite light grey to red, cryptocrystalline, hard (siliceous) trace quartz veining in dolomite.
- 5420 - 5428' Dolomite light to medium brown, cryptocrystalline, siliceous in part, hard, trace quartz veining.
- 5828' Total Depth.

(e) Paleontological Determinations:

None.

SECTION III - ENGINEERING SUMMARY

(a) Drill Stem Tests:

Drill Stem Test No. 1: 2231 - 2531' Basal Cretaceous Sandstone

Times: First flow 3 minutes
ISI 60 minutes
Second flow 60 minutes
FSI 90 minutes

Strong initial air blow. Strong second flow decreasing after 30 minutes, very small at end of test. Recovered 540' watery drilling fluid, 1330' slightly muddy water.

IHP	1137	ISIP	926	IFP	451
FHP	1109	FSIP	931	FFP	922

Drill Stem Test No. 2: 2544 - 2700' Hume Formation

Times: First flow 10 minutes
ISI 35 minutes
Second flow 35 minutes
FSI 60 minutes

Very weak initial blow. Very weak blow on flow, dead in 35 minutes. Pulled up to test another zone, recovery unknown, (est. approx. 10' drilling fluid?)

IHP	1280	ISIP	703	IFP	51
FHP	1238	FSIP	786	FFP	53

Drill Stem Test No. 3: 910 - 1068' Lower Cretaceous Upper Sandstone

Times:	First Flow	5 minutes
	ISI	30 minutes
	Second Flow	60 minutes
	FSI	90 minutes

Fair air blow on preflow. Fair blow on flow, steady through out. Fluid recovery - 425' water.

IHP	450	ISI	448	IFP	119
FHP	404	FSIP	381	FFP	279

Drill Stem Test No. 4: 3920 - 4410' Upper Ronning Group

Times:	First Flow	5 minutes
	ISI	30 minutes
	Second Flow	40 minutes
	FSI	90 minutes

Strong air blow. Strong blow on flow, dead in 45 minutes. Recovered 200' drilling fluid, 3302' water (50,600 pp)

IHP	1905	ISIP	1728	IFP	1579
FHP	1894	FSIP	1736	FFP	1735

(b) Casing Record:

Surface Casing - 9 5/8" to 660' with 645 sacks permafrost cement.

Intermediate Casing - None

(c) Bit Record

<u>No.</u>	<u>Type</u>	<u>Size</u> <u>Jet</u>	<u>Size</u>	<u>Depth</u> <u>Out</u>	<u>Footage</u>	<u>Hours</u>	<u>Conditions</u>
1A	YT3J	3/20	8 3/4	96	96	6 3/4	5-4-0
1B	OSC3J	2/16 1/14	12 1/4	Ream	91	6 1/2	2-3-I
2A	OSC3J	2/16 1/14	8 3/4	125	29	5 1/2	5-2-I
RR1B	OSC3J	1/18 2/16	12 1/4	140	49	10 1/4	6-4-I
2B	OSC3		12 1/4	519	379	19	6-4-I
3B	OSC3		12 1/4	670	151	5	2-6-I
1C	Reed		17 1/2	155	155	4	2-1-I
1	X1G		8 3/4	1539	869	21 3/4	7-4-I
2	X1G		8 3/4	2278	739	13 3/4	3-2-I
2A	Dia.			2312	34	6 3/4	Good
2	2RR		8 3/4	2457	145	4	7-2-0
	Dia.		8 22/30	2517	60	10	Good
3	X55R		8 3/4	3208	691	51 3/4	3-8-0
4	X55R		8 3/4	3612	404	36 1/4	5-5-I
5	X55R		8 3/4	4162	550	51 1/4	4-7-I Locked
6	SCMJ		8 3/4	4859	697	52 3/4	7-8-I
7	SCMJ		8 3/4	5370	511	46 3/4	8-8-0 3/4" out
8	RX55R		8 3/4	5428	58	10 3/4	7-5-I

(d) Mud Report

<u>Date</u>	<u>Type</u>	<u>Amount lbs.</u>	<u>Weight</u>	<u>Viscosity</u>	<u>H₂O Loss</u>	<u>pH</u>	<u>Filter Cake</u>	<u>Additives</u>
03/14/72	Gel, Caustic	4200	8.8 lb/gal	35	20 cc	10.5	1/30	Gel, Caustic, NaBi
03/15/72	Gel, Caustic	4450	10.1	150	8	9.0	1/30	Gel, Caustic, DV68
03/16/72	Gel, Caustic	1900	9.6	51	9.4	9.5	1/30	Gel, Caustic, DV68
03/17/72	Gel, Caustic	2050	9.3	45	11.4	11.0	1/30	Gel, Caustic, DV68
03/18/72	Gel, Caustic	3550	9.6	65	15	11.5	1/30	Gel, Caustic, DV68
03/19/72	Gel, Caustic	7410	9.4	64	16.4	12.0	2/30	Gel, Caustic, DV68 & sawdust
03/20/72	Gel, Caustic							Gel, Caustic, DV68 & sawdust
03/21/72	Gel, water	2200	9.5	91	10.3	11.5	1/32	Gel, Caustic
03/22/72	Gel, water	1200	9.1	32		11.0	2/32	Gel
03/23/72								
03/24/72	Gel, Caustic	2500	9.0	37	11	9.0	2/32	Caustic, Gel
03/25/72	Gel, Caustic	900	9.2	37	12.4	8.5	2/32	Caustic, Gel
03/26/72	Gel, Caustic		9.2	33	16	8	2/32	Caustic, Gel
03/27/72	Gel, Caustic		9.7	34	15.4	8.5	1/30	Caustic, Gel
03/28/72	Polymer	1220	9.5	35	49.0	8.5	1/32	Kelzan, Gel Caustic, Peltex

(d) Mud Record Continued:

<u>Date</u>	<u>Type</u>	<u>Amount lbs.</u>	<u>Weight</u>	<u>Viscosity</u>	<u>H₂O Loss</u>	<u>pH</u>	<u>Filter Cake</u>	<u>Additives</u>
03/29/72	Polymer	350	9.8	33	38.0	9.0	1/32	Kelzan, Gel Caustic
03/30/72	Polymer	800	9.5	31	38.8	8.5	2/32	Kelzan, Gel
03/31/72	Polymer	720	9.3	30	48.0	9.0	1/32	Kelzan, Gel Caustic, Paraformaldehyde
04/01/72	Polymer	1200	9.5	36	40	9.5	2/32	Gel, Caustic
04/02/72	Polymer	350	9.7	37	26	10	2/32	Kelzan, Gel, Caustic
04/03/72	Polymer		9.7	38	20.4	10	2/32	Kelzan, Gel, Caustic
04/04/72	Polymer		9.4	37	26	10.5	2/32	Kelzan, Gel, Caustic
04/05/72	Polymer		9.5	35	40	10.5	3/32	Gel Caustic Kelzan sawdust
04/06/72	Polymer		9.4	34	32	10	3/32	Gel caustic Kelzan
04/07/72	Polymer		9.7	34	41	10	3/32	Gel caustic Kelzan
04/08/72	Polymer		9.7	34	60	10.5	3/32	

(e) Deviation Record:

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
90	2 1/4	2220	1/2
150	1 1/2	2640	1/2
235	1 1/4	3018	1
357	3/4	3426	1 1/2
507	1 1/2	3856	1/2
600	1 1/4	4485	3/4
914	3/4	4832	3/4
1690	1/8	5428	3/4

(f) Abandonment Plugs:

Plug No. 1 - 5322 - 5162'

Plug No. 2 - 2445 - 2725'

(g) Lost Circulation Zones:

414' - lost 250 bbls.

580' - lost 100 bbls.

4645' - 75 bbls. estimated regained immediately.

(h) Report of Blowouts:

None.

SECTION IV - LOGS

Logs - Schlumberger

1. Dual Induction - Laterolog - 660 - 5397'
2" and 5"
2. BHC Sonic - Gamma Ray - Caliper - Gamma Ray - 0 - 5422'
Sonic - 660 - 5422'
2" and 5"
3. Compensated Formation Density - Gamma Ray - Caliper
800 - 1200', 2100 - 5415'
2" and 5"
4. SNP Log Caliper - 800 - 1200', 2100 - 5415'
5"
5. Synergetic Dolomite - Limestone Lithology Plot
800 - 1200, 2100 - 5415'
5"
6. Four Arm Continuous Dipmeter - 660 - 5417'
2" and 5"
7. Sidewall Core Gun
13 Sidewall Cores

SECTION V - ANALYSIS

- (a) Core Analysis - See attached analysis of Core #2
- (b) Water Analysis - See attached analyses.
- (c) Gas Analysis - Nil.
- (d) Oil Analysis - Nil.

SECTION VI - COMPLETION SUMMARY

(a) Tubing Record:

2" 58 joints at 1217' cemented with 440 sacks of neat construction cement. Thermistors for Department of Mines (Temperature Survey).

(b) Perforation Record:

None.

(c) Cementation Record:

Plug No. 1 - 5322 - 5162'

with 70 sacks neat construction cement.

Plug No. 2 - 2445 - 2725'

with 230 sacks construction cement plus 2% CaCl_2 .

(d) Acidization and Fracturing Record:

None.

(e) Back Pressure and Production Tests:

None.

CORE ANALYSIS REPORT

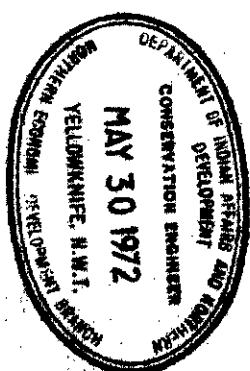
FOR

ATLANTIC RICHFIELD CANADA LTD.

ARCO WEST WHITEFISH RIVER H-34

WHITEFISH R.

NORTHWEST TERRITORIES



CORE LABORATORIES - CANADA LTD.

Petroleum Reservoir Engineering

CALGARY - EDMONTON - REGINA

WELL NAME	OWNER	YR CORE	TOP	BOTTOM	LOCATION	TYPE
W WHITEFISH H-34	ARCO	72	2478 2504	2505	C-57052 C-57051	MICRO

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

WATER ANALYSIS

Lab No. E72-8635-3

Received: Apr. 14, 1972 Reported: Apr. 27, 1972

Well: Location: ARCO West Whitefish H-34

Operator: ATLANTIC RICHFIELD CANADA LTD.

Field or Area:

Elev.: K.B.

Grd.

Zone/Formation:

Curlatious

Sample Interval: 910' - 1068'

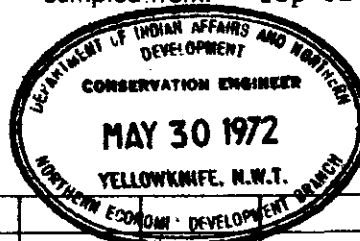
Method of Production: D.S.T. #3

Sampled from: Top of tool

Sampled by:

Date: Apr. 11, 1972

OTHER PERTINENT DATA Recovered 425 ft.

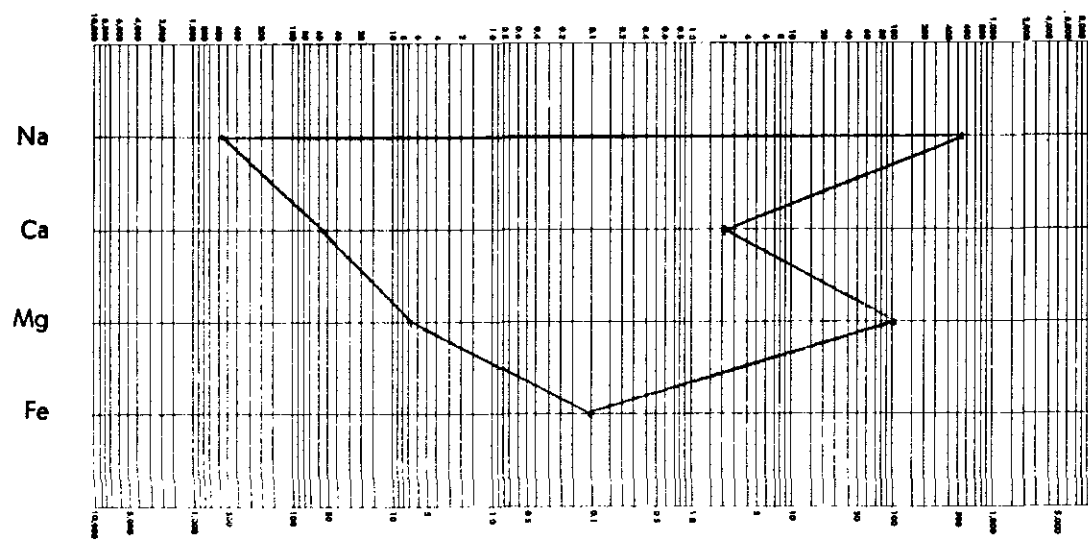


(Signed)

	Na & K	K	Ca	Mg				SO ₄	Cl			CO ₃	HCO ₃	OH	
Mg./L	13,553		1,109	83				4,861	19,450			Nil	130	Nil	
Meq./L	589.57		55.34	6.82				101.11	548.49			---	2.13	---	
Meq. %	45.23		4.25	0.52				7.76	42.08			---	0.16	---	

Total Solids Mg/L: By Evaporation 39,960 Fe Trace Specific Gravity 1.033 @60°F Observed pH 7.3 @ 75 °F
 Calculated 39,186 After Ignition 38,220 H₂S Nil Refractive Index 1.3399 @25°C Resistivity 0.241 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks and Conclusions

Sample consisted of slightly muddy water. The filtrate was pale yellow in color. Organic matter present in dissolved solids.

E72-8635-1: Top.

RESISTIVITY: 0.224 OHM-Meters @ 68°F.

Sample consisted of slightly muddy water.

E72-8635-2: Middle.

RESISTIVITY: 0.230 OHM-Meters @ 68°F.

Sample consisted of slightly muddy water.

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

WATER ANALYSIS

Lab No. E72-8636-4

Received: Apr. 14, 1972 Reported: Apr. 27, 1972

Well: Location: ARCO West Whitefish H-34

Operator: ATLANTIC RICHFIELD CANADA LTD.

Field or Area:

Elev.: K.B. Grd. Zone/Formation:

Sample Interval: 3922' - 4410'

Method of Production: D.S.T. #4

Sampled from: Bottom Hole Sampler

Sampled by: Johnston Testers

Date: Apr. 11, 1972

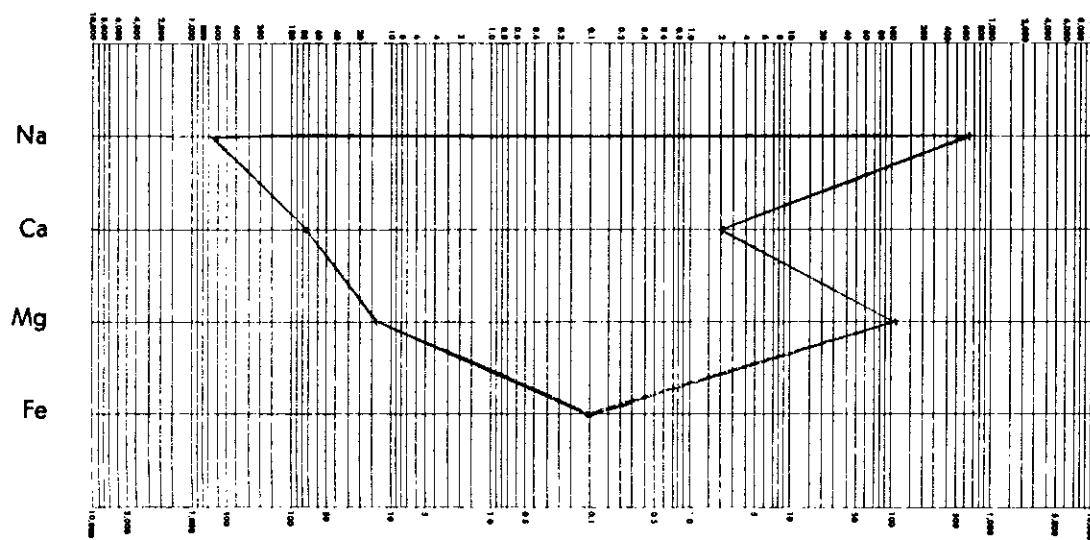
OTHER PERTINENT DATA Recovered 3500 ft.

(Signed)

	Na & K	K	Ca	Mg					SO ₄	Cl			CO ₂	HCO ₃	OH	
Mg./L	15,957		1,477	175					5,851	23,350			N11	125	N11	
Meq./L	694.13		73.70	14.39					121.70	658.47			---	2.05	---	
Meq. %	44.37		4.71	0.92					7.78	42.09			---	0.13	---	

Total Solids Mg/L: By Evaporation 49,030 Fe Present Specific Gravity 1.038 @60°F Observed pH 7.5 @ 75 °F
 Calculated 46,935 After Ignition 46,690 H₂S N11 Refractive Index 1.3411 @25°C Resistivity 0.203 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks & Conclusions: Sample received in Johnston Tester bottom hole sampler #519 @ 0 psig. Contained in the sampler was 2500 cc. of water and 250 cc. of gas.

E72-8636-1: Top of fluid.

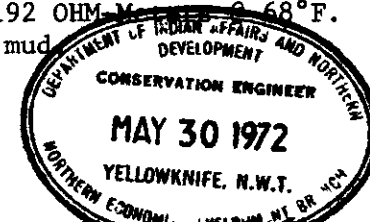
RESISTIVITY: 0.149 OHM-Meters @ 68°F.
 Sample consisted of watery mud.

E72-8636-2: Middle.

RESISTIVITY: 0.195 OHM-Meters @ 68°F.
 Sample consisted of muddy water.

E72-8636-3: Bottom (Top of tool).

RESISTIVITY: 0.192 OHM-Meters @ 68°F.
 Sample consisted of watery mud.



CHEMICAL & GEOLOGICAL LABORATORIES LTD.

WATER ANALYSIS

Lab No. C72-4574

Received: Apr. 3, 1972 Reported: April 14, 1972

Well: Location: West White Fish River H-34

Operator: ATLANTIC RICHFIELD CANADA LTD.

Field or Area: White Fish River

Elev.: K.B. Grd. Zone/Formation:

Sample Interval: 2517'

Method of Production:

Sampled from: Flow Line while Coring Sampled by: Wilson Mud Ltd.

Date: Mar. 26, 1972

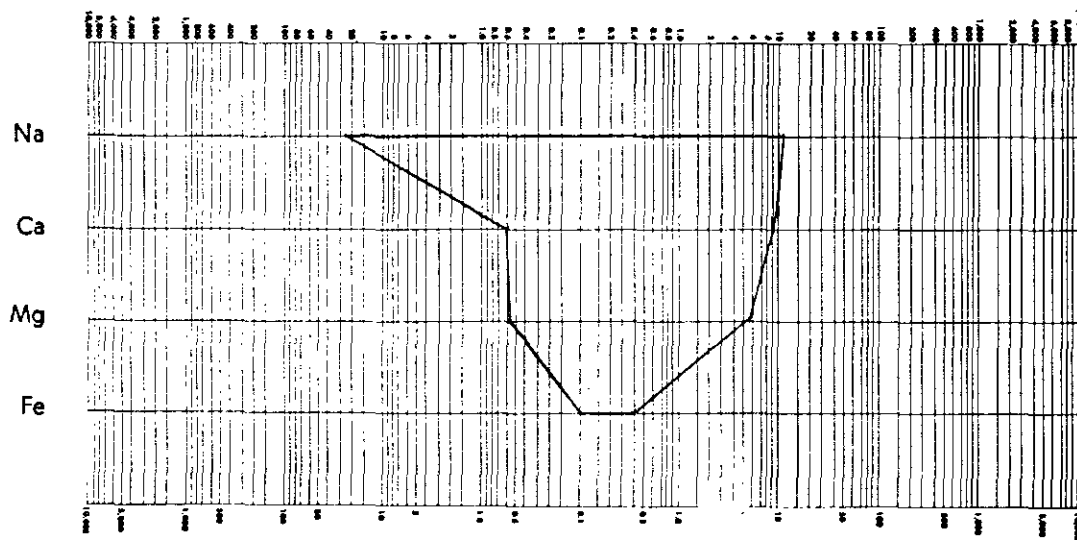
OTHER PERTINENT DATA

(Signed)

	Na & K		Ca	Mg				SO ₄	Cl			CO ₃	HCO ₃		
Mg./L	572		12	7				263	390			12	560		
Meq./L	24.87		0.60	0.58				5.47	11.00			0.40	9.18		
Meq. %	47.74		1.15	1.11				10.50	21.11			0.77	17.62		

Total Solids Mg/L: By Evaporation 1,868 Fe Nil Specific Gravity 1.003 @60°F Observed pH 8.7 @ 78 °F
 Calculated 1,816 After Ignition 1,432 H₂S Nil Refractive Index 1.3330 @25°C Resistivity 3.94 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks and Conclusions

Analysis determined on clear colorless filtrate recovered from mud. Much organic matter detected in evaporated total dissolved solids.
 Resistivity on Mud: 4.44 ohm-meters at 68°F.



CORE LABORATORIES - CANADA, LTD.

Company ATLANTIC RICHFIELD CANADA LTD. Formation
Well ARCO WEST WHITEFISH RIVER H-34 Drilling Fluid WATER BASE MUD
Field WHITEFISH R. NORTH WEST TERRITORIES Elevation
Location 65 33'24.00 Analysis FULL DIAMETER, RESIDUALS ON END
Date Report APRIL 24/72
Analysts WD OK GM EV

Page 1 of 3
File 911-2104
Date Report APRIL 24/72
Analysts WD OK GM EV

Remarks
GLAZED SURFACE ON ALL SAMPLES REMOVED PRIOR
TO PERMEABILITY MEASUREMENTS.

AST - APPEARS SIMILAR TO
* - BROKEN CORE (K90 USED
FOR SUMMARY PURPOSES)
** - PERMEABILITY > 30000 MD

FS - FINE SAND
MS - MEDIUM SAND
CS - COARSE SAND

CONG - CONGLOMERATE
DOL - DOLOMITE
SH - SHALE
LMY - LIMY

SHY - SHALY
BKS - BREAK
BIT - PYROBITUMEN
CARB - CARBONACEOUS

A - ANHYDRITE
FOSS - FOSSILIFEROUS
XLR - CRYSTALLINE
LAM - LAMINATIONS

V - VUGULAR
LV - LARGE VUGS
SV - SMALL VUGS
PPV - PIN-POINT VUGS

I - INTERGRANULAR
STY - STYLOLITIC
HF - HORIZONTAL FRACTURE
VF - VERTICAL FRACTURE

SS - SMALL PLUG SAMPLE
SL - SLIGHTLY
VZ - VEIN
W - WITH

Sample Number	Interval Represented, Feet		Permeability to Air, Millidarcys			Permeability Feet	Porosity, Per Cent	Porosity Feet	Density, gm./cc.		Residual Saturations, Per Cent Pore Space		Visual Examination
	Depth	Thick	K Max	K90 ^o	KV				Bulk	Grain	Oil	Total Water	

CORED INTERVAL 2292' - 2531'

CORE NO. 1 2292' - 2326' (REC. 34.0')

-	2292.0-26.0	34.0	-	-	-	-	-	-	-	-	-	-	NOT RECEIVED
-	2326.0-71.0	145.0	-	-	-	-	-	-	-	-	-	-	DRILLED

CORE NO. 2 2471' - 2531' (REC. 56.0') (16 BOXES)

1	2471.0-71.5	0.5	242.00	239.00	43.40	121.00	14.9	7.45	2.25	2.64	0.0	55.3	F-MS
2	2471.5-72.3	0.8	153.00	125.00	39.20	122.40	13.4	10.72	2.30	2.65	0.0	68.2	F-MS CARB/BKS
3	2472.3-73.1	0.8	82.00	68.40	56.40	65.60	13.1	10.48	2.27	2.61	3.6	76.5	FS CHERT CARB/BKS
-	2473.1-73.3	0.2	-	-	-	-	-	-	-	-	-	-	SHY
4	2473.3-74.0	0.7	23.10	6.77	12.30	16.17	13.0	9.10	2.32	2.67	0.0	81.3	FS SILTY VF
5	2474.0-75.1	1.1	18.80	11.60	8.35	20.68	14.0	15.40	2.29	2.66	0.0	80.2	FS SILTY
6	2475.1-75.8	0.7	1.59	1.38	1.24	1.11	9.8	6.86	2.38	2.63	Trace	83.6	FS SILTY SH/BKS
SS7	2475.8-76.3	0.5	3.99	3.32	3.15	2.00	13.4	6.70	-	-	0.0	65.7	FS SILTY
8	2476.3-77.4	1.1	13.60	12.70	9.90	14.96	13.4	14.74	2.30	2.65	0.0	53.2	FS SILTY
9	2477.4-78.1	0.7	17.30	16.60	8.18	12.11	13.3	9.31	2.31	2.66	0.0	65.0	FS
-	2478.1-78.7	0.6	-	-	-	-	-	-	-	-	-	-	SH
10	2478.7-79.6	0.9	6.40	4.30	0.86	5.76	11.7	10.53	2.36	2.67	0.0	74.3	FS SILTY SH/BKS
-	2479.6-79.8	0.2	-	-	-	-	-	-	-	-	-	-	SH
11	2479.8-80.6	0.8	*	5.82	*	4.66	11.3	9.04	2.36	2.66	0.0	74.2	FS SILTY VF
-	2480.6-80.9	0.3	-	-	-	-	-	-	-	-	-	-	SH
12	2480.9-81.6	0.7	1.24	1.17	0.90	0.87	6.6	4.62	2.46	2.63	0.0	59.7	FS SILTY SH/BKS
SS13	2481.6-82.0	0.4	1.73	1.31	0.76	0.69	11.6	4.64	-	-	0.0	62.8	FS
SS14	2482.0-82.6	0.6	1.87	1.52	0.55	1.12	8.0	4.80	-	-	Trace	68.8	FS SILTY SH/BKS
15	2482.6-83.4	0.8	69.80	63.00	47.30	55.84	14.6	11.68	2.26	2.64	0.0	52.0	FS SILTY SH/BKS

CORE LABORATORIES - CANADA, LTD.

Company ATLANTIC RICHFIELD CANADA LTD.
Well ARCO WEST WHITEFISH RIVER H-34

Formation
Drilling Fluid WATER BASE MUD

Page 2 of 3
File 911-2104

Sample Number	Interval Represented, Feet		Permeability to Air, Millidarcys			Permeability Feet	Porosity, Per Cent	Porosity Feet	Density, gm./cc.		Residual Saturations, Per Cent Pore Space		Visual Examination
	Depth	Thick	K Max	K90°	KV				Bulk	Grain	Oil	Total Water	
CORE NO. 2 (Cont'd)													
16	2483.4-84.0	0.6	32.00	19.90	20.90	19.20	13.6	8.16	2.38	2.75	0.0	69.5	FS PYRITES
17	2484.0-85.0	1.0	43.40	33.60	22.70	43.40	15.2	15.20	2.26	2.66	0.0	81.7	FS SILTY CARB
18	2485.0-86.0	1.0	94.40	86.90	62.60	94.40	17.8	17.80	2.17	2.64	0.0	84.1	FS
19	2486.0-86.8	0.8	*	191.00	*	152.80	18.6	14.88	2.14	2.63	0.0	80.8	FS VF
20	2486.8-87.4	0.6	91.70	90.70	40.40	55.02	17.6	10.56	2.18	2.64	3.3	77.0	FS CARB/BKS
-	2487.4-87.5	0.1	-	-	-	-	-	-	-	-	-	-	SH
21	2487.5-88.0	0.5	24.20	23.10	6.33	12.10	12.7	6.35	2.31	2.64	5.6	84.5	FS SILTY SH/BKS
22	2488.0-88.7	0.7	9.39	8.71	0.45	6.57	11.5	8.05	2.33	2.63	3.2	70.8	FS SILTY SH/BKS
23	2488.7-89.5	0.8	7.15	7.15	0.82	5.72	13.5	10.80	2.26	2.61	15.8	62.3	FS CARB/BKS
SS24	2489.5-90.1	0.6	50.20	49.00	32.60	30.12	19.8	11.88	-	-	0.0	67.2	FS HF
SS25	2490.1-90.8	0.7	62.20	60.00	42.00	43.54	16.8	11.76	-	-	0.0	67.2	FS SILTY
26	2490.8-91.7	0.9	83.40	72.10	41.40	75.06	16.9	15.21	2.19	2.63	0.0	80.5	FS CARB/BKS VF HF
27	2491.7-92.5	0.8	2.77	0.62	0.55	2.22	7.1	5.68	2.45	2.64	4.9	81.5	FS SHY
28	2492.5-93.4	0.9	168.00	166.00	127.00	151.20	17.1	15.39	2.19	2.64	Trace	72.7	FS
29	2493.4-94.0	0.6	252.00	249.00	169.00	151.20	17.2	10.32	2.20	2.66	0.0	78.4	F-MS
30	2494.0-94.8	0.8	242.00	228.00	124.00	193.60	16.1	12.88	2.24	2.66	0.0	71.5	FS
31	2494.8-95.7	0.9	220.00	189.00	117.00	198.00	16.1	14.49	2.23	2.65	0.0	76.0	F-MS VF HF
32	2495.7-96.3	0.6	260.00	230.00	133.00	156.00	15.1	9.06	2.26	2.67	0.0	75.6	FS VF
33	2496.3-96.9	0.6	126.00	125.00	66.00	75.60	12.9	7.74	2.32	2.66	0.0	74.0	FS CARB/BK
34	2496.9-97.6	0.7	244.00	235.00	124.00	170.80	14.0	9.80	2.29	2.66	0.0	80.2	FS
35	2497.6-98.3	0.7	70.30	60.10	16.40	49.21	10.0	7.00	2.43	2.70	0.0	70.3	FS SH/BK
36	2498.3-98.8	0.5	181.00	155.00	43.50	90.50	14.5	7.25	2.28	2.67	0.0	48.4	FS CARB/BK
-	2498.8-27.0	28.2	-	-	-	-	-	-	-	-	-	-	DENSE LIMESTONE
-	2527.0-31.0	4.0	-	-	-	-	-	-	-	-	-	-	LOST CORE.

CORE LABORATORIES — CANADA, LTD.

Petroleum Reservoir Engineering

WELL:	ARCO WEST WHITEFISH RIVER H-34	PAGE: 3 of 3
FORMATION:		FILE: 911-2104
SUMMARY INTERVAL:	2292.0 - 2531.0	
TOTAL FOOTAGE:	239.0	
FOOTAGE ANALYZED	26.4	
FOOTAGE NOT ANALYZED:	TOTAL: 212.6 DENSE 29.6 LOST 4.0 DRILLED 145.0 *NABR 34.0 RUBBLE .0	

**SUMMARY
OF
ANALYZED CORE:**

	FOOTAGE	% OF ANALYZED CORE	WEIGHTED AVERAGE POROS. %	POROSITY FEET	WEIGHTED AVERAGE PERM. MD.	PERM. FEET	WEIGHTED AVERAGE RESID. OIL %	WEIGHTED AVERAGE TOT. WATER %
TOTAL	26.4	100.00	13.88	366.33	84.14	2221.23	1.00	72.05
BY PERM RANGES:								
LESS THAN 0.10 Md.	.0	.00	.00	.00	.00	.00	.00	.00
0.10 0.49 Md.	.0	.00	.00	.00	.00	.00	.00	.00
0.50 0.99 Md.	.0	.00	.00	.00	.00	.00	.00	.00
1.00 9.99 Md.	6.9	26.14	10.39	71.72	4.45	30.72	2.72	71.06
GREATER THAN 9.99 Md.	19.5	73.86	15.11	294.61	112.33	2190.51	.39	72.41

*NOT ANALYZED BY REQUEST



CORE LABORATORIES - CANADA LTD.

Petroleum Reservoir Engineering

COMPANY ATLANTIC RICHFIELD CANADA LTD. FIELD WHITEFISH R. FILE 911-2104WELL ARCO WEST WHITEFISH RIVER H-34 DATE APR. 3/72LOCATION 65 33'24.00 PROV NORTH WEST TERRITORIES ELEV. **CORE-GAMMA CORRELATION**

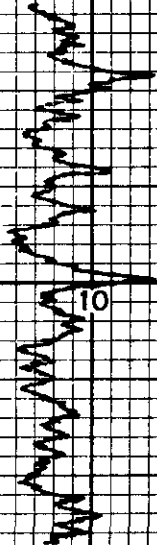
These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories - Canada Ltd. (all errors and omissions excepted); but Core Laboratories - Canada Ltd. and its officers and employees assume no responsibility and make no warranty or representations, as to the productivity, pressure operation, or profitability of any oil, gas or other mineral well or sand in connection with such report as used or relied upon.

TC 11 SECS

VERTICAL SCALE: 5" = 100'

SENS 5000 CPM

CORE No. 2 2471.0 - 2531.0 REC. 56.0'



2500

2550

CORE LAB

Benzene and Toluene Determinations

DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT
CONSERVATION ENGINEER
MAY 30 1972
YELLOWKNIFE, N.W.T.
NORTHERN E.D. (2044) V6173 51 47 BRANCH



Company Atlantic Richfield Canada Ltd.

Well ARCO West Whitefish River H-34 K.B. Grd. 745'
65 33'24.00 N.L.

Location 124 35' 45.00 W.L. Field Whitefish River Area Province N.W.T.

Formation _____ Interval _____

Sampled from DST #1 (MFE Chamber #527) by Johnston Testers

Date sampled March 26/72 Date analysed April 4/72 Analyst LK

DST Recovery:	1870' Liquid.
Tool Recovery:	2500 cc's Muddy Water.

Mud type _____ Water cushion _____

Total Solids:

Resistivity 0.22 Ohm-meters @ 70 °F Calculated 32,770 mg/liter

Specific gravity 1.0223 @ 60°F By evaporation @ 110°C 1 mg/liter

pH 5.9 H₂S Absent By evaporation @ 180°C - mg/liter

Refractive Index 1.3382 @ 75°F At ignition - mg/liter

MILLIGRAMS PER LITER

Na + K	Ca	Mg	Fe	Ba	Br	I	Cl	HCO ₃	SO ₄	CO ₃	OH
10907	1083	375	Pres.	Abs.	-	-	18216	44	2145	Nil	Nil

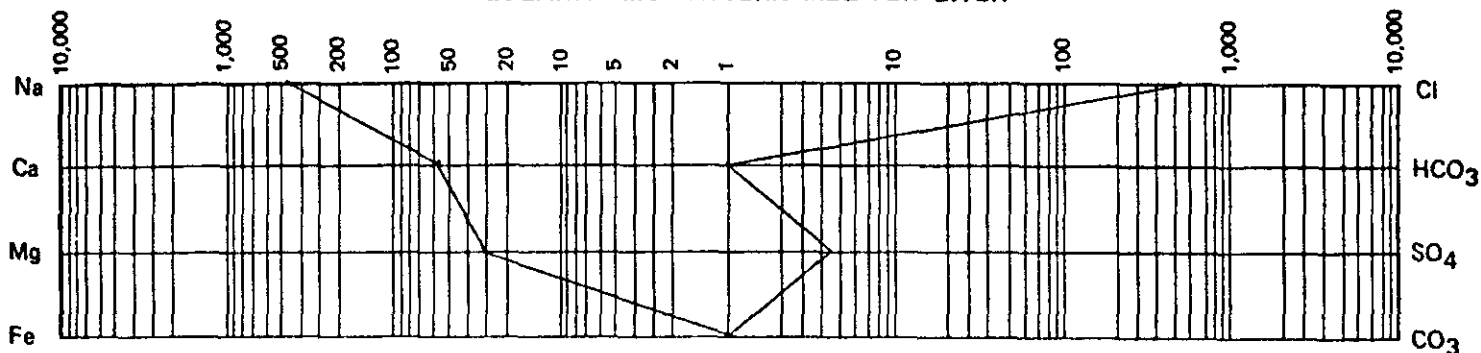
PER CENT CALCULATED SOLIDS

33.3	3.3	1.1	Pres.	Abs.	-	-	55.6	.1	6.5	.0	.0
------	-----	-----	-------	------	---	---	------	----	-----	----	----

MEQ PER LITER

474.2	54.0	30.8	Pres.	Abs.	-	-	513.7	.7	44.6	.0	.0
-------	------	------	-------	------	---	---	-------	----	------	----	----

LOGARITHMIC PATTERN MEQ PER LITER



31987. 10907.0

CONFIDENTIAL

CHEMICAL & GEOLOGICAL LABORATORIES LIMITED

OPERATOR: ATLANTIC RICHFIELD CANADA LTD.

REPORT NUMBER: E72-8636-2/-3

DATE SAMPLED: April 11, 1972

DATE RECEIVED: April 14, 1972

DATE REPORTED: April 27, 1972

<u>LABORATORY NUMBER</u>	<u>BENZENE CONTENT</u>	<u>TOLUENE CONTENT</u>	<u>REMARKS</u>
E72-8636-2	No trace of benzene indicated	0.13 P.P.M.	Sample was received in a 1 quart metal container with a foil insert present in the screw cap. Container was 3/4 full, water was muddy and appeared to be a good sample.
E72-8636-3	No trace of benzene indicated	No trace of toluene indicated	Sample was received in a 1 quart metal container with a foil insert present in the screw cap. Container was 1/3 full, water was muddy and did not appear to be a good sample.



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OPERATOR: ATLANTIC RICHFIELD CANADA LTD.

REPORT NUMBER: E72-8635-2/-3

DATE SAMPLED: April 11, 1972

DATE RECEIVED: April 14, 1972

DATE REPORTED: April 27, 1972

<u>LABORATORY NUMBER</u>	<u>BENZENE CONTENT</u>	<u>TOLUENE CONTENT</u>	<u>REMARKS</u>
E72-8635-2	No trace of benzene indicated	0.14 P.P.M.	Sample was received in a 1 quart metal container with a foil insert present in the screw cap. Container was full, water was slightly muddy, and appeared to be a good sample.
E72-8635-3	No trace of benzene indicated	0.28 P.P.M.	Sample was received in a 1 quart metal container with a foil insert present in the screw cap. Container was 3/4 full, water was slightly muddy, and appeared to be a good sample.



CHEMICAL & GEOLOGICAL LABORATORIES LTD.

Edmonton

Fort St. John

Calgary

GAS ANALYSIS REPORT: Lab. No. E72-8636-4 Received: Apr. 14, 1972 Reported: Apr. 27, 1972Well: ARCO West Whitefish H-34 Operator: ATLANTIC RICHFIELD CANADA LTD.Field or Area: _____ Location: _____ Elev.: K.B. Grd. _____Zone and Formation: _____ Sample Interval: 3922' - 4410'

Well production at sampling time: Oil _____ bpd; Gas _____ MCFD; Water _____ bpd.

Sampled from: Bottom Hole Sampler Sampled by: Johnston Testers Date: Apr. 11, 1972

Pressure: (a) at point of sampling _____ psig (b) Gas Bomb pressure _____ psig

Temperature: (a) at point of sampling _____ °F (b) Separator _____ °F

Pressures: Reservoir _____ Tubing _____ Casing _____ Separator _____

OTHER PERTINENT DATA Method of Production: D.S.T. #4. Recovery: 3500 ft.

(Signed)

COMPOSITION	% by Volume	G.P.M. in Imp. Gal. @ 60°F. & 14.65 PSIA	G.P.M. (Calculated)	SPECIFIC GRAVITY
Helium	_____	_____	_____	Calculated _____ <u>0.944</u>
Hydrogen sulfide	<u>0.</u>	_____	_____	Insufficient by Weight _____ <u>Sample</u>
Carbon dioxide	<u>0.09</u>	_____	_____	CRITICALS (Calculated)
Nitrogen	<u>92.75</u>	_____	_____	Pc _____ <u>506.1</u>
Methane	<u>6.00</u>	_____	_____	Tc _____ <u>238.0</u>
Ethane	<u>1.07</u>	_____	_____	VAPOR PRESSURE (Calc.) @ 100°F. Pentanes + _____ <u>0.</u>
Propane	<u>0.06</u>	<u>0.014</u>	<u>0.014</u>	<u>H₂S</u> Grains per 100 cu. ft. @ 60°F. & 14.65 p.s.i.a. _____ <u>0.</u>
Isobutane	<u>TRCE</u>	<u>0.</u>	_____	GROSS B.T.U. (Calc.) @ 60°F. & 14.65 p.s.i.a. (dry) _____ <u>81.8</u>
N-butane	<u>0.03</u>	<u>0.008</u>	_____	(sat.) _____ <u>80.3</u>
Isopentane	<u>TRCE</u>	<u>0.</u>	_____	Acid Gas Free (dry) _____ <u>81.8</u>
N-pentane	<u>TRCE</u>	<u>0.</u>	_____	DEW POINT (Calc.) p.s.i. 950 1050 1200
Hexanes	<u>0.</u>	<u>0.</u>	_____	FAH. <u>-61</u> <u>-61</u> <u>-61</u>
Heptanes	<u>0.</u>	<u>0.</u>	_____	Mol. Wt.: Total Gas <u>27.353</u> Heptanes + _____ <u>0.</u>
Octanes	<u>0.</u>	<u>0.</u>	_____	Received in Johnston Testers tool #519 @ 0 psig.
Nonanes	<u>0.</u>	<u>0.</u>	_____	Sampler contained 2500 cc. water and 250 cc. gas.
Decanes +	<u>0.</u>	<u>0.</u>	_____	Air contamination 65%. All figures corrected for this.
TOTAL	<u>100.00</u>	<u>0.022</u>	_____	

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TEST DATA				TOOL SEQUENCE		
Type of Test	Open Hole, Bottom Hole			Tool	Length	O.D.
Time Started in Hole	0830	Hrs.	Tool Opened	1102	Hrs.	
First Flow	3	Min.	Initial Shut-In	60	Min.	
Second Flow	60	Min.	Second Shut In		Min.	
Third Flow		Min.	Final Shut In	90	Min.	
Pulled Loose @	1435	Hrs.	Out of Hole	1605	Hrs.	
Wt. Set/on Packers	30,000	#	Pulled Loose Wt.	25,000+	#	
Description of Blow During Test						
Strong initial air blow. Strong sec-						
ond flow, decreasing after 30 minutes,						
very small at end of test.						
FLUID RECOVERY Was Test Reverse Circulated Yes ☐ No ☒						
Total Fluid Recovered 1870 Ft.						
Description of Fluid Recovered						
540' watery drilling fluid.						
1330' slightly muddy water.						
GAS BLOW MEASUREMENT						
Measured With				I.D. Riser		
Time	Stce. Choke	Reading psi inches	M Cubic Feet/Day			
			NIL			
Test satisfactory.						
Pipe tally showed hole was 14' deeper interval						
was originally to be 2217-2517, but is 2231-2531.						
RESISTIVITY SALT CONTENT						
Recovery Water	@	°F.	500	ppm.		
Mud Pit sample filtrate	@	°F.	500	ppm.		
District	Edmonton	Ticket No.	D07209	Date	March 26/72	Test No.
Company	Atlantic Richfield Canada Ltd.			Address	650 Guinness House	J.T. No.
Well Name	ARCO West Whitefish River H-34				727 - 7th Ave. S.W., Calgary 2, Alberta	
Number	65°33'24"N 124°35'45"W			Field	Whitefish R.	Province
Formation				Co Rep.	Bob Buchan	
Interval	2231-2531			Technician	A.G. Datta	
Distribution of Reports 5-Mr. P.G. Rayer, Calgary						
TOOL SEQUENCE						
P.O. Sub				Length		O.D.
D.P. Sub				.75		
MFE Tool				.85		
Bypass Tool				9.10		
Jars				3.00		
Safety Joint				6.80		
S.S. & Packer				1.75		
T.C. & Packer				9.27		7 3/4"
Total				5.13		7 3/4"
				36.65		
Stub				1.20		
Perfs				25.00		
Recorder				5.95		
Recorder				5.95		
Perf				1.00		
Subs				1.65		
Drill Collars				257.98		
B.N. & Perf				1.70		
Total Interval				300.43		
TOTAL LENGTH 337.08						
Elevation G.L. 760 K.B. 772.20						
Bottom Hole Choke Size 1/2"						
Fluid Cushion Type Nil Amt.						
MUD AND HOLE DATA						
Mud Type		Gel		W.L. 15.1		
Filter Cake		2/32		Visc. 37		Wt. 9.5
Time Taken						
Contractor		Tri-City Drilg.		Rig No. 2		
Drill Pipe Size		4 1/2" XH				
Drill Collar Size		2 7/8" ID		&		
Drill Collar Length		371.55'		&		
Main Hole Size		8 3/4"		Re Hole		

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PRESSURE INCREMENTS ON RECORDER # AK1-3409

[illegible]

**JOHNSTON TESTERS**

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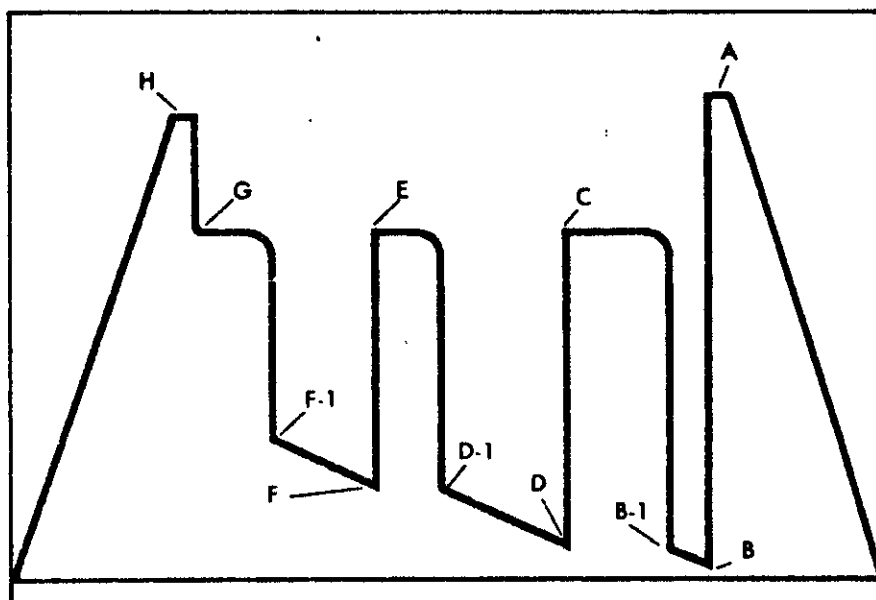
GUIDE TO IDENTIFICATION OF DRILL STEM TEST PRESSURE CHARTS

FIELD
REPORT NO.

D07209

RECORDER NO.

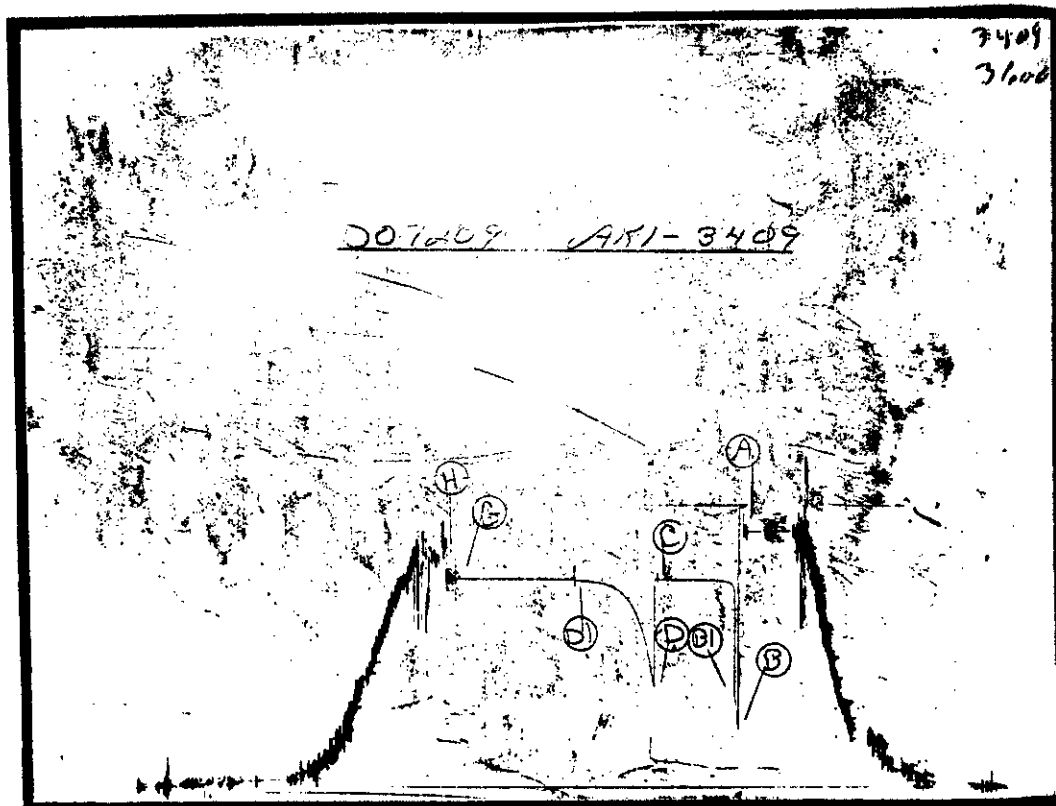
AK1-3409



- A. Initial Hyd. Mud
- B. First Flow
- C. Initial Shut-In
- D. Second Flow
- E. Second Shut-In
- F. Third Flow
- G. Final Shut-In
- H. Final Hyd. Mud

The following points are either fluctuating pressures or points indicating other packer settings (testing different zones).

- A-1, A-2, A-3, etc. Initial Hyd. Pressures
- Z — Special pressure points such as pumping pressures recorded for formation breakdown.





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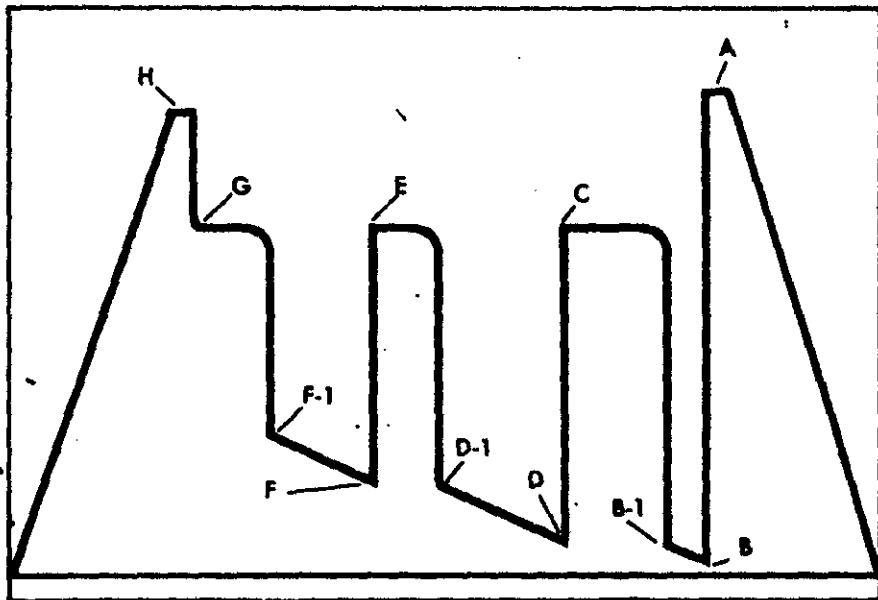
GUIDE TO IDENTIFICATION OF DRILL STEM TEST PRESSURE CHARTS

FIELD
REPORT NO.

D07209

RECORDER NO.

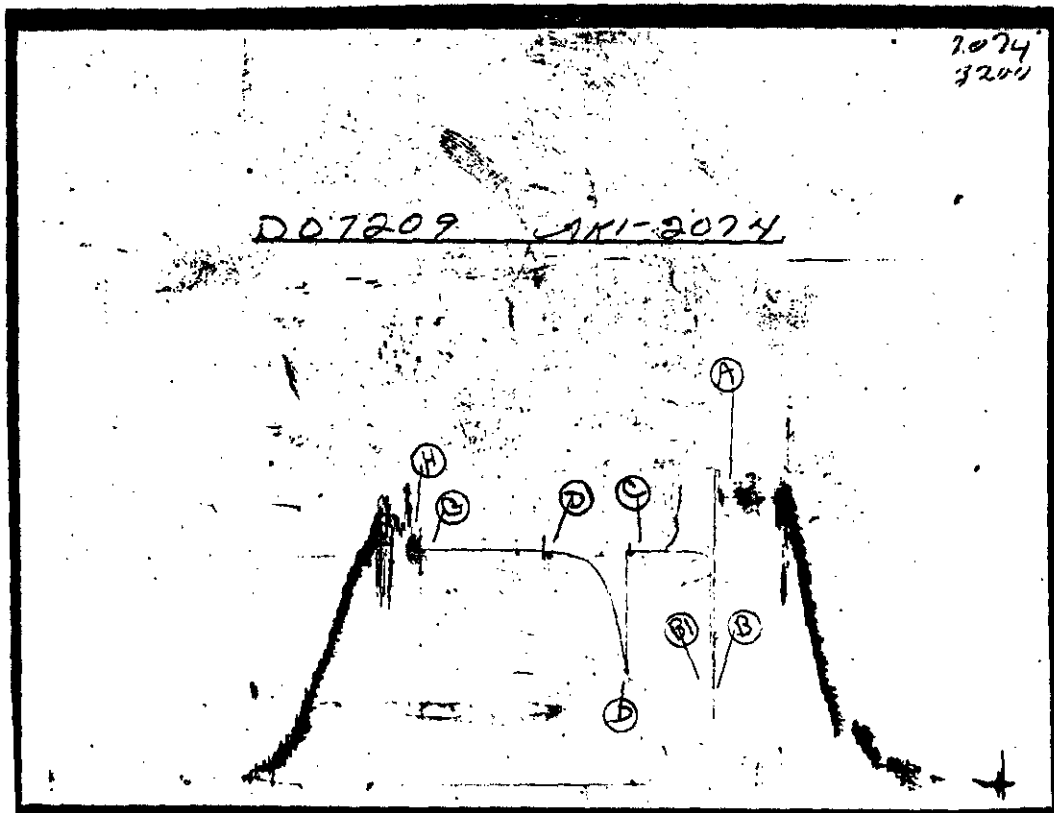
AK1-2074



- A. Initial Hyd. Mud
- B. First Flow
- C. Initial Shut-In
- D. Second Flow
- E. Second Shut-In
- F. Third Flow
- G. Final Shut-In
- H. Final Hyd. Mud

The following points are either fluctuating pressures or points indicating other packer settings (testing different zones).

A-1, A-2, A-3, etc. Initial Hyd. Pressures
Z — Special pressure points such as pumping pressures recorded for formation breakdown.



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TEST DATA						TOOL SEQUENCE		
Type of Test	Open Hole, Straddle, Selective zone					Tool	Length	O.D.
Time Started in Hole	1700	Hrs.	Tool Opened	2011	Hrs.	P.O. Sub	.75	
First Flow	10	Min.	Initial Shut-In	35	Min.	Sub	1.00	
Second Flow	35	Min.	Second Shut In		Min.	MFE Tool	9.50	
Third Flow		Min.	Final Shut In	60	Min.	Bypass Tool	3.02	
Pulled Loose @	2230	Hrs.	Out of Hole		Hrs.	Jars	6.50	
Wt. Set/on Packers	23,000	#	Pulled Loose Wt.	30,000	#	Safety Joint	1.75	
Description of Blow During Test						S.S. & Packer	9.38	7 3/4"
Very weak initial blow. Very weak blow on flow, dead in 35 minutes.						T.C. & Packer	5.20	7 3/4"
						Total	32.10	
						Stub	1.20	
						Perfs	28.00	
						Recorder	5.90	
						Recorder	5.90	
						Sub	.75	
						Drill Collar	109.80	
						Sub	.75	
						Travel Collar	3.50	
						Total Interval	155.80	
						Packer	2.90	7 3/4"
						T.C. & Packer	6.40	7 3/4"
						Blank off sub	.75	
						Recorder	5.90	
						Setting Tool	5.38	
						Total Below Intv	21.35	
						TOTAL LENGTH	209.23	
						Elevation G.L.	745	K.B. 757
						Bottom Hole Choke Size	1/2"	
						Fluid Cushion Type	Nil	Amt.
						MUD AND HOLE DATA		
						Mud Type	Palmer Gel	W.L. 35.0
						Filter Cake	2/32	Visc. 35 Wt. 9.5
						Time Taken		
						Contractor	Tri City Drig.	Rig No. 2
						Drill Pipe Size	4 1/2" XH	
						Drill Collar Size	2 7/8" ID	&
						Drill Collar Length	145'	&
						Main Hole Size	8 3/4"	Pat Hole
						RESISTIVITY SALT CONTENT		
Recovery Water @ °F. ppm.								
Mud Pit sample filtrate @ °F. ppm.								
District	Inuvik	Ticket No.	D07156	Date	April 10, 1972	Test No.	(2)	J.T. No. 2
Company	Atlantic Richfield Canada Ltd.			Address	727 - 7th Ave. S.W.			
Well Name	ARCO West Whitefish River H-34			Calgary, Alberta				
Number	65°33'24"N 124°35'45"W			Field	Whitefish R.	Province	N.W.T.	
Formation	Hume	Thickness		Co. Rep.	Steve Montgomery			
Interval	2544 - 2700		T.D.	5428	Technician	Don L'Heureux		
Distribution of Reports						5 - F.G. Rayer, Calgary		

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REMARKS:

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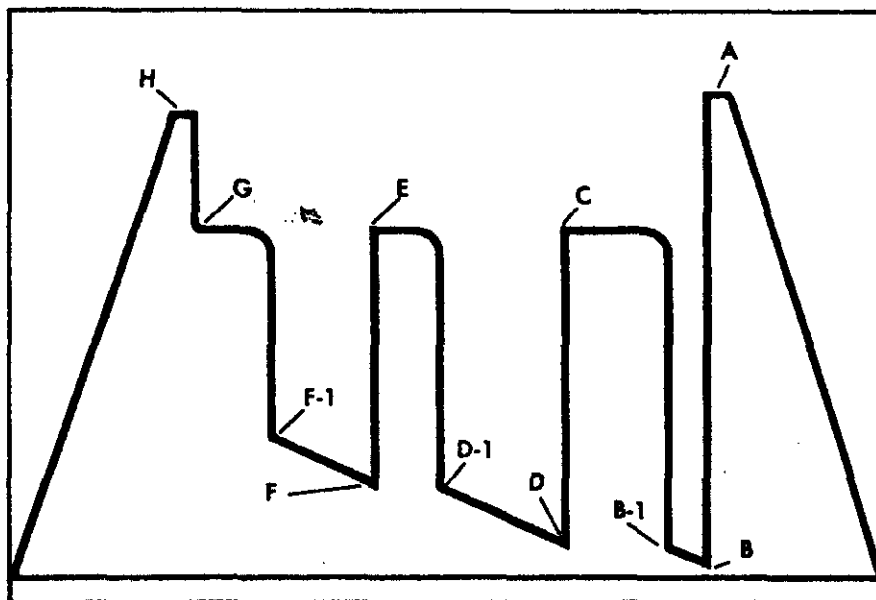
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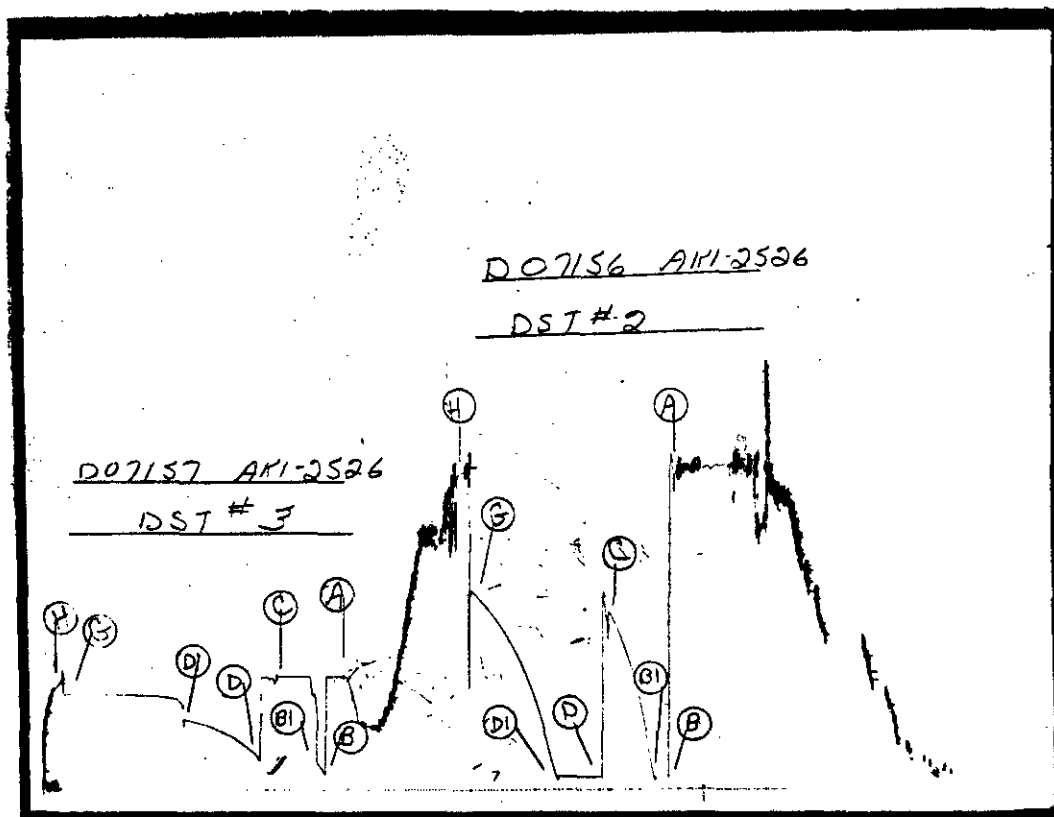
GUIDE TO IDENTIFICATION OF DRILL STEM TEST PRESSURE CHARTS

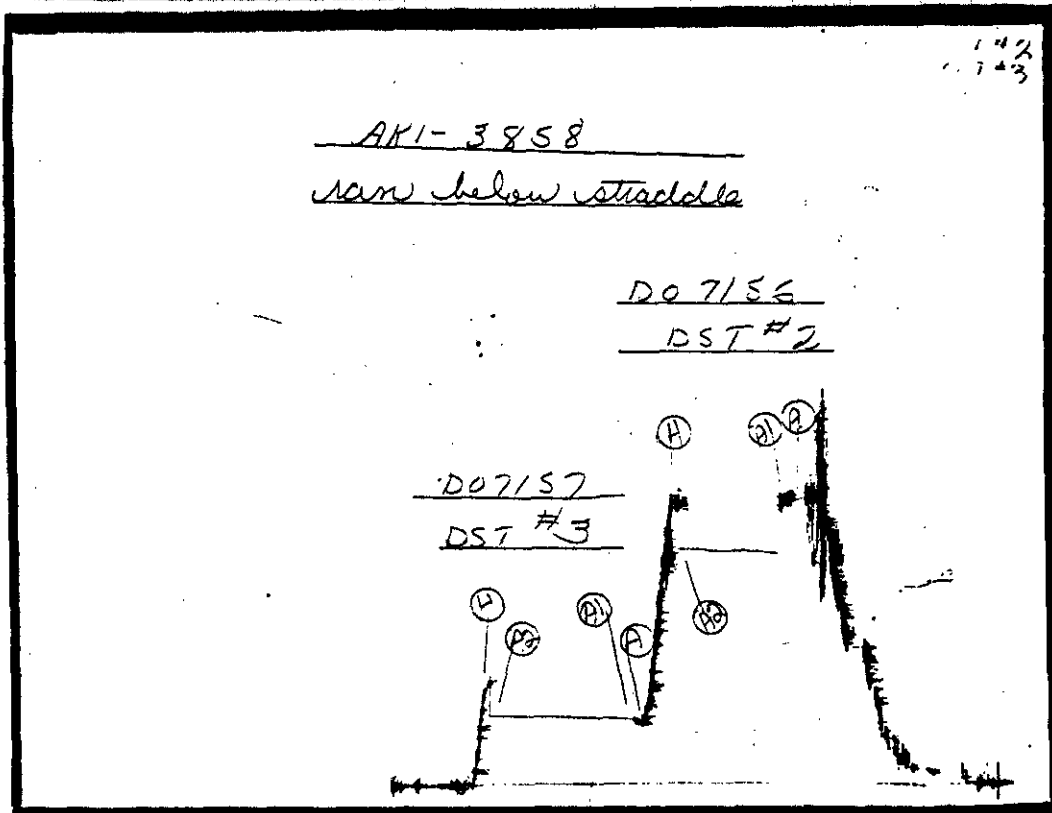
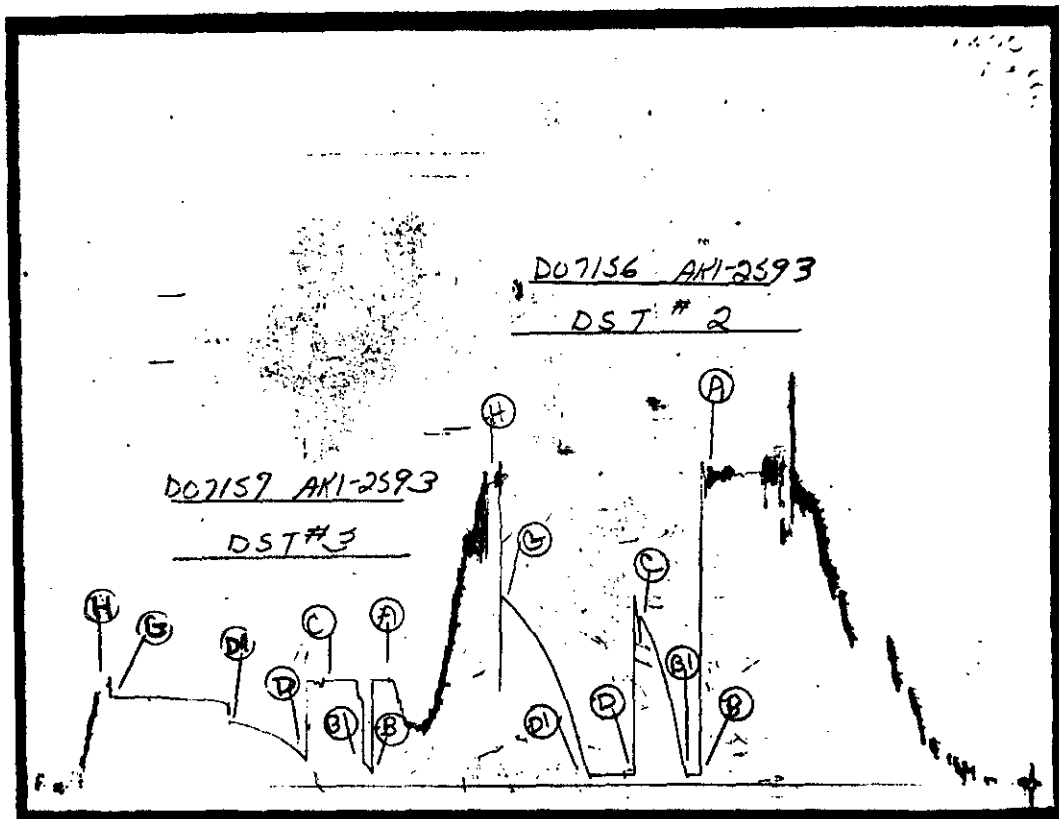
FIELD
REPORT NO.
D07156RECORDER NO.
AK1-2526

- A. Initial Hyd. Mud
- B. First Flow
- C. Initial Shut-In
- D. Second Flow
- E. Second Shut-In
- F. Third Flow
- G. Final Shut-In
- H. Final Hyd. Mud

The following points are either fluctuating pressures or points indicating other packer settings (testing different zones).

A-1, A-2, A-3, etc. Initial Hyd. Pressures
Z - Special pressure points such as pumping pressures recorded for formation breakdown.





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TEST DATA						TOOL SEQUENCE		
Type of Test	Open Hole, Straddle,		Selective zone					
Time Started in Hole	Hrs.	Tool Opened	0003	Hrs.	P.O. Sub	Length .75	O.D.	
First Flow	5 Min.	Initial Shut-In	30	Min.	Sub	1.00		
Second Flow	60 Min.	Second Shut In		Min.	MFE Tool	9.50		
Third Flow	Min.	Final Shut In	90	Min.	Bypass Tool	3.02		
Pulled Loose @	0308 Hrs.	Out of Hole	0400	Hrs.	Jars	6.50		
Wt. Set/on Packers	15,000 #	Pulled Loose Wt.	5,000	#	Safety Joint	1.75		
Description of Blow During Test								
Fair air blow on preflow. Fair blow on flow, steady throughout.								
FLUID RECOVERY Was Test Reverse Circulated Yes ☐ No ☒								
Total Fluid Recovered	425	Ft.						
Description of Fluid Recovered	425' water.							
GAS BLOW MEASUREMENT								
Measured With						I.D. Riser		
Time	Sfcs. Choke	Reading psi inches	M Cubic Feet/Day					
NIL								
REMARKS: Test satisfactory.								
RESISTIVITY SALT CONTENT								
Recovery Water @ °F.	32,400	ppm.						
Mud Pit sample filtrate @ °F.		ppm.						
District	Inuvik	Ticket No.	D07157	Date	April 11, 1972	Test No.	(3)	
Company	Atlantic Richfield Canada Ltd.			Address	J.T. No. 3			
Well Name	ARCO West Whitefish River H-34							
Number	65°33'24"N 124°35'45"W							
Formation	Lower Cretaceous	Thickness		Field	Whitefish R.	Province	N.W.T.	
Interval	910 - 1068	T.D.	5428	Co. Rep.	Steve Montgomery			
Distribution of Reports	Technician Don L'Heureux							
5 - F.G. Raver, Calgary								

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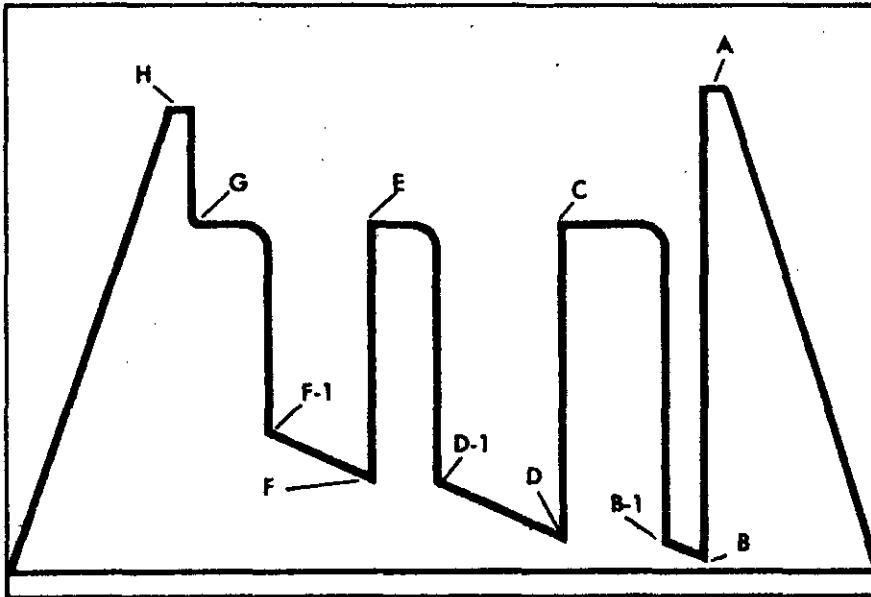
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GUIDE TO IDENTIFICATION OF DRILL STEM TEST PRESSURE CHARTS

FIELD
REPORT NO.
D07157

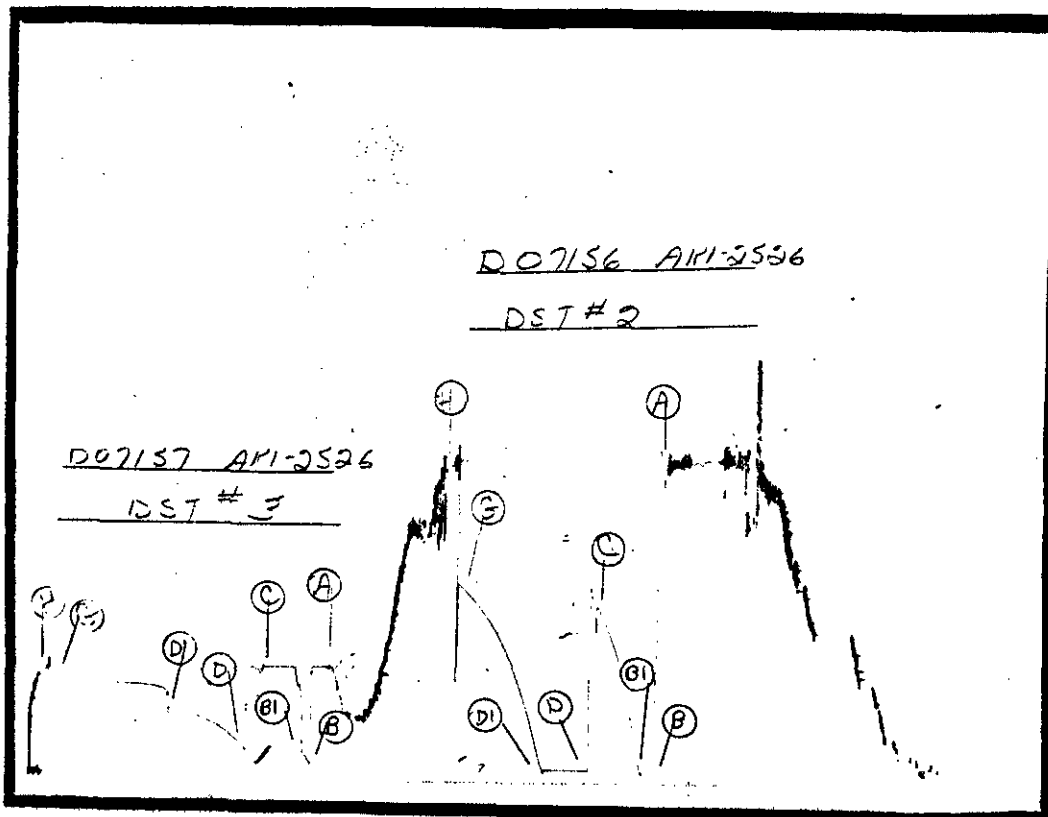
RECORDER NO.
AR1-2526



- A. Initial Hyd. Mud
- B. First Flow
- C. Initial Shut-In
- D. Second Flow
- E. Second Shut-In
- F. Third Flow
- G. Final Shut-In
- H. Final Hyd. Mud

The following points are either fluctuating pressures or points indicating other packer settings (testing different zones).

A-1, A-2, A-3, etc. Initial Hyd. Pressures
Z — Special pressure points such as pumping pressures recorded for formation breakdown.

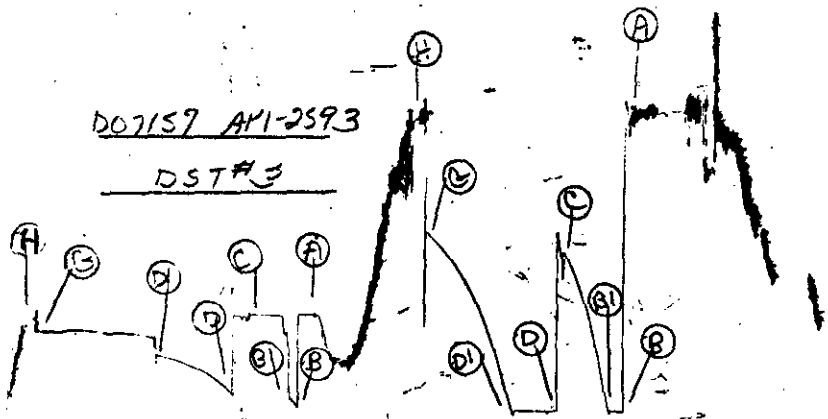


D07156 AKI-2593

DST # 2

D07157 AKI-2593

DST # 3



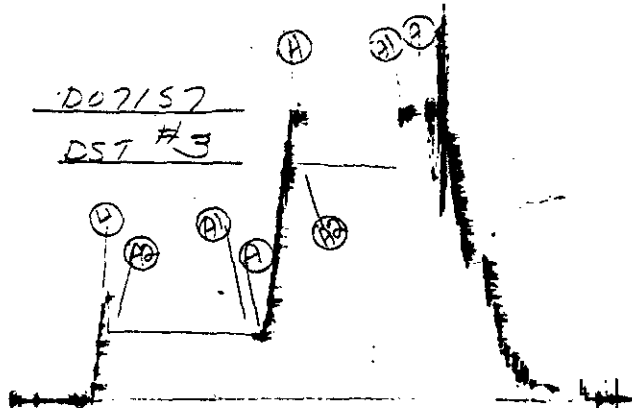
AKI-3858
now below straddle

D07156

DST # 2

D07157

DST # 3



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TEST DATA					
Type of Test	Open Hole, Straddle, Selective zone				
Type Started in Hole	Hrs.	Tool Opened	Hrs.		
First Flow	5 Min.	Initial Shut-In	30 Min.		
Second Flow	40 Min.	Second Shut In			
Third Flow	Min.	Final Shut In	90 Min.		
Pulled Loose @	1235 Hrs.	Out of Hole	1900 Hrs.		
Wt. Set/on Packers	20,000 #	Pulled Loose Wt.	10,000 #		
Description of Blow During Test					
Strong air blow. Strong blow on flow, dead in 45 minutes					
FLUID RECOVERY Was Test Reverse Circulated Yes ☐ No ☒					
Total Fluid Recovered	3502 Ft.				
Description of Fluid Recovered					
200' drilling fluid. 3302' water,					
GAS BLOW MEASUREMENT					
Measured With		I.D. Riser			
Time	Sfce. Choke	Reading psi inches	M Cubic Feet/Day		
NIL					
REMARKS: Test satisfactory.					
RESISTIVITY SALT CONTENT					
Recovery Water	@	°F.	50,600 ppm.		
Mud Pit sample filtrate	@	°F.	ppm.		
District	Inuvik	Ticket No.	D07158	Date	April 11, 1972
Company	Atlantic Richfield Canada Ltd.		Address	727 - 7th Ave. S.W., Calgary, Alberta	
Well Name	ARCO West Whitefish River H-34		Field	Whitefish R. Province N.W.T.	
Number	65°33'24"N 124°35'45"W		Co. Rep.	Steve Montgomery	
Formation	Thickness		Technician	Don L'Heureux	
Interval	3920 - 4410 T.D. 5428				
Distribution of Reports	5-F.G. Rayer, Calgary				

TOOL SEQUENCE		
Tool	Length	O.D.
P.O. Sub	.75	
Sub	1.00	
MFE Tool	9.50	
Bypass Tool	3.02	
Jars	6.50	
Safety Joint	1.75	
S.S. & Packer	9.38	7 3/4"
T.C. & Packer	5.20	7 3/4"
Total	32.10	
Stub	1.20	
Perfs	22.00	
Recorder	5.90	
Recorder	5.90	
Sub	.75	
Drill Pipe	450.79	
Sub	.75	
Travel Collar	3.50	
Total Interval	490.79	
Packer	2.90	7 3/4"
T.C. & Packer	6.40	7 3/4"
Blank off sub	.75	
Recorder	5.90	
Setting Tool	5.38	
Total Below Intv.	21.33	
TOTAL LENGTH 539.12		
Elevation G.L.	745 K.B.	757
Bottom Hole Choke Size	1/2"	
Fluid Cushion Type	N11 Amt.	
MUD AND HOLE DATA		
Mud Type	Palmer Gel W.L.	35.0
Filter Cake	2/32 Visc. 35 Wt.	9.5
Time Taken		
Contractor	Tri City Drilling Rig No.	2
Drill Pipe Size	4 1/2" XH	
Drill Collar Size	4 1/2" XH H-90 &	
Drill Collar Length	600' &	
Main Hole Size	8 3/4" Rat Hole	
Test No. (4) J.T. No. 4		

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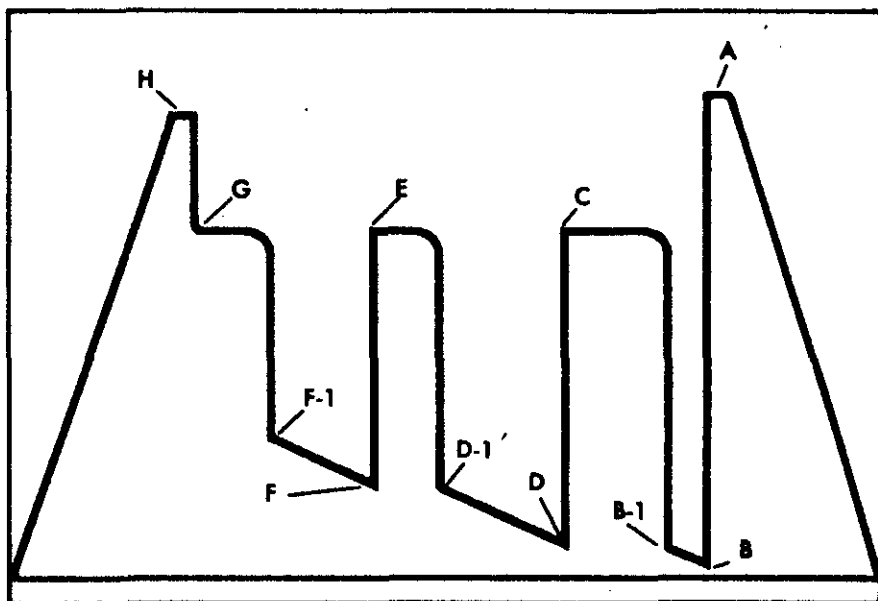
GUIDE TO IDENTIFICATION OF DRILL STEM TEST PRESSURE CHARTS

FIELD
REPORT NO.

D07158

RECORDER NO.

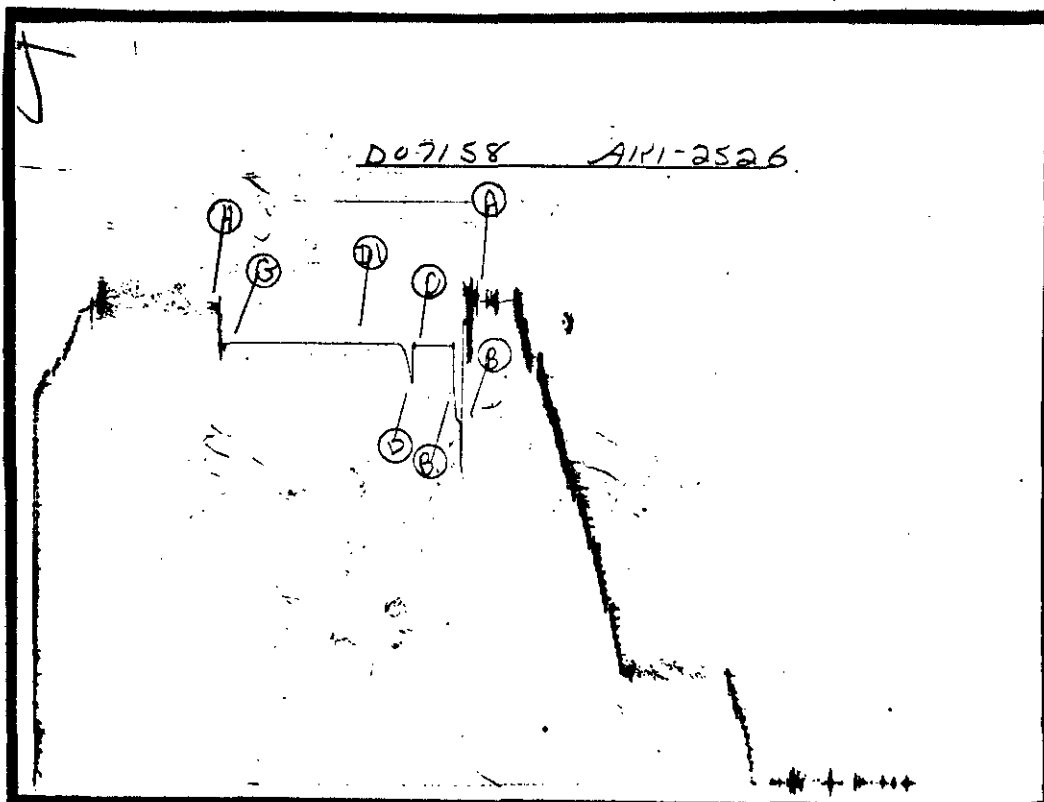
AK1-2526



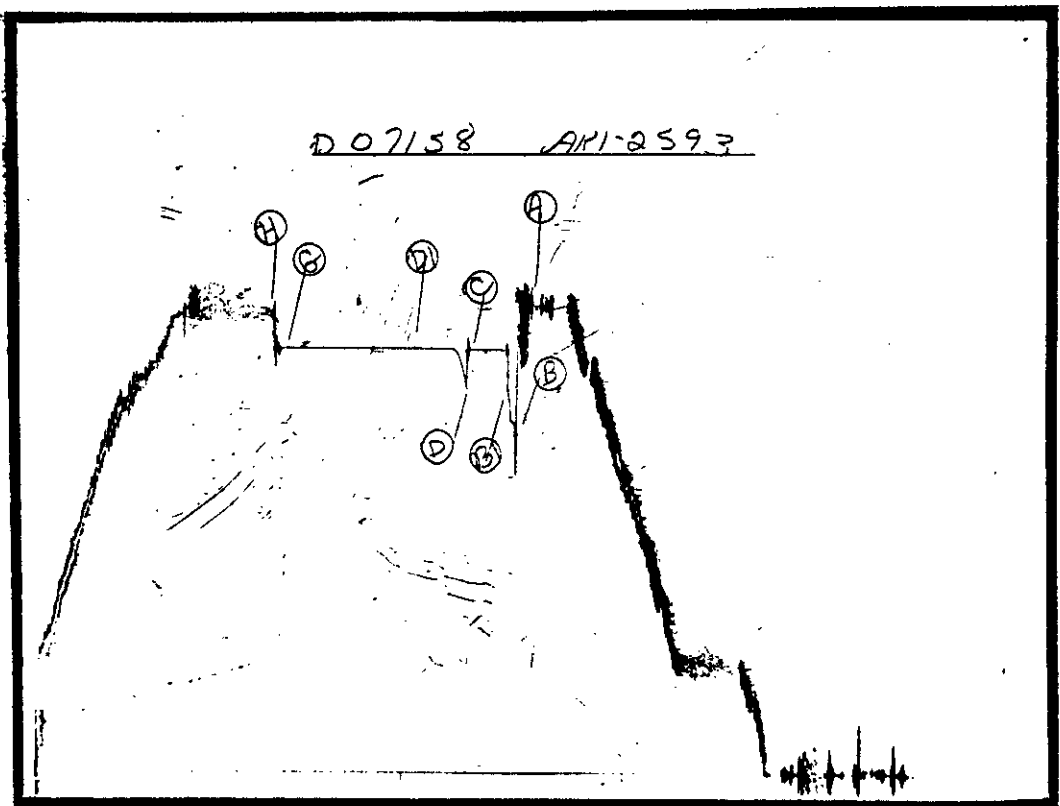
- A. Initial Hyd. Mud
- B. First Flow
- C. Initial Shut-In
- D. Second Flow
- E. Second Shut-In
- F. Third Flow
- G. Final Shut-In
- H. Final Hyd. Mud

The following points are either fluctuating pressures or points indicating other packer settings (testing different zones).

A-1, A-2, A-3, etc. Initial Hyd. Pressures
Z — Special pressure points such as pumping pressures recorded for formation breakdown.

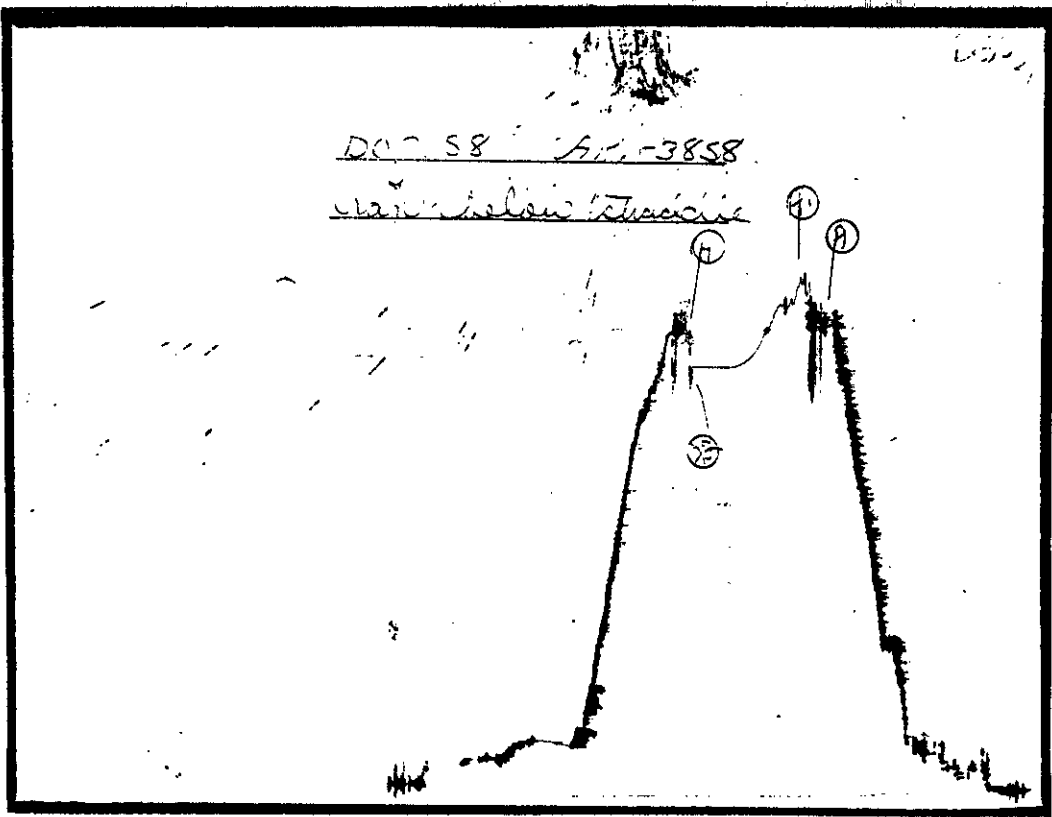


D07158 AM-2593



D0758 AM-3858

Wash. below Tropic



Well Name & No - Nom et n ^o du puits	Permit No. - N ^o de permis	Lease No. - N ^o de concession
---	---------------------------------------	--

LOCATION — EMBLACEMENT				
Unité — Unité	Section	Grid — Étendue quadrillée	Latitude	Longitude
H	34	65-40-124-30	65 33'24"	124 35'45"
Unique Well Identifier — Code d'ordinateur			Universal Well Location Reference — Références universelles d'emplacement du puits	
300H 346540124300			65.5567 N Lat., 124.5958 E. Long.	

CASING RECORD - TUBAGE

Geological Tops Sommet des formations	Elevation - Profondeur		Core Record - Carottes					
	Depths Sous le niveau du sol	Sub-Sea Sous le niveau de la mer	From - de	To - à	Rec. Récupérées	From - de	To - à	Rec. Recup.
Cretaceous	330	+ 427	2278	2312	25			
Basal Cret Sd	2212	-1455	2471 -	2531 -	60			
Devonian								
Hume	2480	-1723						
Bear Rock	2730	-1973						
Siluro Ordovician								

52.90-2 (7-71)

CEMENTING RECORD (Plug, Setting CIMENTATION (Bouchon, sous pression, etc.))				PERFORATING RECORD (Bullet, Jet) PERFORATION (à balles, à jet)				SERVICING RECORD (Acidizing, Fracing, etc.) ENTRETIEN (acidification, fracturation, etc.)			
Date	From - de	To - à	Remarks - Remarques	Date	From - de	To - à	Remarks - Remarques	Date	From - de	To - à	Remarks - Remarques
✓ 4-12-72	5322	5162	No Feel								
✓ 4-12-72	2445	2725	Felt at 2400'								
	Ran 2" line pipe for "Terrestrial Heat Flow Monitoring"						--				--

DRILL STEM TESTS - ESSAIS AUX TIGES

No. - N°	Date	Formation	From - de	To - à	V.O. Mins. Vanne ouverte (minutes)	I.S.I. Mins. Première obturation (minutes)	F.S.I. Mins. Obturation définitive (minutes)	I.S.I.B.H.P. Pression de fond à la 1 ^{re} obturation	F.S.I.B.H.P. Pression de fond à l'obturation définitive	I.F.B.H.P. Pression de fond au jaillissement	F.F.B.H.P. Pression de fond à l'écoulement définitif	L.H.P. Pression hydrostatique de début	F.H.P. Pression hydrostatique définitive	Remarks - Remarques
1	3-26-72	Cretaceous	2231	2531	60	✓ 60	✓ 90	✓ 926	✓ 931	✓ 451	✓ 922	✓ 1137	✓ 1109	Rec 1870' Fluid -540 Mud ✓ -1330 Water
2	4-10-72	Hume	2544	2700	✓ 35	✓ 35	✓ 60	777	777	78	78	1269	1269)	Rec 425' Salt Water
3	4-11-72	Cretaceous	✓ 910	✓ 1066	✓ 60	✓ 30	✓ 90	None (Pkr Slip)	380	118	268	436	436)	
4	4-11-72	Siluro - Ordovician (Ronning)	3820	4410	45	✓ 30	✓ 90	1659	1659	1500	1659	1755	1755	Rec 200' Mud 3300' Salt Water ✓
Readings are Field Results														

ANALYSIS - ANALYSE

Lab. No. N° de laboratoire	Sample Echantillon	From - de	To - à	Source	Remarks - Remarques	PRESENT STATUS OF WELL ETAT ACTUEL DU PUIT		Company Société	
C72-4574	Water			Chem & Geo Labs		Oil Pétrole	(Interval)(intervalle)	Atlantic Richfield Canada Ltd.	
						Gas Gaz	(Interval)(intervalle)	Signed by Signé par	
						Dry Sec	X	Title Titre	
						Susp. Travaux sus.		Date	
								Forms to be prepared in duplicate and forwarded to the District Conservation Engineer. Préparer les formules remplies à l'ingénieur en conservation du district.	

