LITHOLOGIC WELL LOG

RS00826000

CHEVRON RESOURCES COMPANY

WELL NO. JORDAN-1

PROSPECT NEALS BULLY CREEK STATE OREGON

COUNTY MALHEUR SECTION 9 NW 1/4 NW 1/4 NW 1/4

TOWNSHIP 18S

DATE 12-20-79 RANGE 41E

DEPTH	%	LITHOLOGY	MUD TEMPS IN	MUD TEMPS OUT
0 - 20		55% gray to buff colored mildly silicified siltstone 40% red (Fe^{3+} stained) mildly to moderately silicified siltstone 5% glassy to milky white amorphous silica. Rounded tabular surfaces indicate precipitation in open veins or spaces.	ND	ND
20 - 40		As above	47	48
40 - 60		Light gray calcargous clayey siltstone. Tuffacceous source is indicated by the presence of glass (rare) shards and fragments. Water deposition indicated by the presence of fossel fragments (ostracods, <1 mm diameter). Note: Upon drilling, this unit turns into a thick gloppy clay which slowly passes into solution with circulation.	45	49
60 - 80		As above, with crystalline calcite ranging up to 5 mm across	45	47
80 - 100		As above with trace amounts of sulphide (chalcopyrite) Slightly coarser grained (to fine sand) at this level.	45	48
100 - 120		As above	45	48
120 - 140		As above	43	48
140 - 160		As above Color change in approx. 10% of the sample to medium-dark gray. Approximately 3% of the sample is silicious red siltstone but these chips are foreign to this horizon and are probably sluffed in from above.	42	48
160 - 180		80% medium gray tuffaceous, calcareous sandy siltstone. More richly fossiliferous than above with small (<1 mm diam.) ostracod? Fragments (still comprising <<1% however). 20% of the sample consists of red siliceous siltstone, once again probably sluffed in.	44	47
180 - 200		As above with approximately 5% red siltstone (sluff?). Strongly calcareous.	45	48

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200 - 220		As above	45	48
220 - 240		90% medium gray tuffaceous, calcareous sandy siltstone 10% purple calcareous sandy siltstone. Some fragments contain black, somewhat sperical glass cinders ~1 mm diam.	44	46
240 - 260		A. B.	46	50
260 - 300		A. B.	56 56	60 61
320		Slightly coarser grained (to med. sand) but texturally immature, poorly sorted equivalent to above. Strongly calcareous and contains 1-3% black glass shards and chips. Note: Changes to a thick gloppy clay during drilling (as above). The fine grained matrix material dissolves into solution leading to the total breakdown of the rock.	50	70 after casing
320 - 340		40% AA 60% medium gray very fine grained welded tuff. Concoidal fracture, glassy sheen (siliceous appearance) Sometimes color banded in medium-light grays. [Note: Iron chips in following ~150' are from welds in outflow system]	43	70
340 - 360		70% very fine grain glassy appearing medium gray welded tuff 30% fine grained, calcareous vitric tuff or tuffaceous sandy siltstone. Medium gray, sometimes salt & pepper with up to 30% dark gray glass shards (?)	43	70
360 - 380		A. A. with approximately 2% creamy yellow opaline silica	43	70
380 - 420		A. A.	48	70
420 - 440		50% A. A. 50% dark gray, well indurated silty shale some of which shows a shaley foliation trace creamy yellow opaline silica	48	69

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440 - 460		15% dark gray silty shale 50% med gray vitric banded welded tuff. 35% med gray and salt & pepper fine gr tuff or tuffaceous sandy siltstone, calcareous.	51	69
460 - 480		30% dark gray, non calcareous silty shale (well indurated). 40% salt and pepper to medium gray, mindly calcareous fine grain tuff or tuffaceous sandy siltstone. 30% medium gray vitric banded welded tuff trace of crystalline calcite.	64	82
480 - 500		AA Trace crystalline calcite Trace black glass	64	87
500 - 520		AA Trace creamy yellow opaline silica.	70	86
520 - 540		Fine grained medium to light gray, calcareous tuff or tuffaceous sandy siltstone Trace crystalline calcite	82	90
540 - 600		A. A.	86	100
600 - 620		A. A. Trace Pyrite Trace black glass	95	103
620 - 640		Pinkish brown fine grained tuffaceous sandy siltstone (60%) 40% medium gray tuffaceous sandy siltstone Trace crystalline calcite.	99	111
640 - 680		A. A.	103	111
680 - 700		A. A. (99%) 1% creamy yellow opaline silica Trace black glass	113	122
700 - 760		A. A.	121	132
760 - 780		AA (96%) 2% creamy yellow opaline silica 2% black glass	129	132

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DEPTH	%	LITHOLOGY	MUD TEMPS IN	MUD TEMPS OUT
780 - 800		60% pinkish-brown colored tuffaceous sandy siltstone 40% medium gray calcareous tuffaceous sandy siltstone.	123	131
800 - 820		A. A. Trace crystalline calcite	122	133
820 - 840		97% A. A. 3% dark gray well indurated siltstone Trace creamy yellow opaline silica Trace black glass Trace milky white silica veining or laminee	130	134
840 - 860		A. A.	123	138
860 - 880		Not sampled	ND	ND
880 - 920		A. A.	120	140 change pits
920 - 940		99% A. A. 1% calcite veins and grains Trace milky white silica veining or laminee. [Note: The following 100 feet had poor sample returns, those described may not be truely representative.]	120	140
940 - 960		A. A.	128	140
960 - 980		97% A. A. 3% fine grained, medium gray welded tuff, siliceous in appearance Trace calcite veining.	130	140
980 - 1000		97% A. A. 3% dark gray siltstone Trace black glass	128	140
1000- 1020		40% medium gray, calcareous, tuffaceous sandy siltstone 50% pinkish brown tuffaceous sandy siltstone 9% dark gray → black welded tuff and glass 1% muscovite flakes (to 3 mm diameter).	130	140
1020- 1040		A. A. with approximately 2% muscovite flakes Trace of red (hematitic) crusty stained grains.	130	140

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1060- 1080		Not sampled	119	142
1080- 1100		Altered Porphyritic basalt, olive green to med. gray. Lots of plagioclase phenocrysts quartz and pyrite veining Minor calcite veining.	136	146
1100- 1120		92% fresh black to extensively altered (greenish gray) porphyritic basalt 2% free quartz grains, sometimes associated with pyrite and chalcopyrite as vein minerals 6% buff to reddish brown fine grained tuff	ND	ND
1120- 1140		AA	stopped for 12 hr & mixed mud 75	124
1140- 1160		Medium gray to olive gray altered porphyritic basalt. Plagioclase phenocrysts. Trace quartz veining.	118	130
1160- 1180		Fresh dark gray to extensively alt. porphyritic basalt A. A. Plagioclase laths to 2 mm length Trace of calcite veining and alteration quartz veining and free colorless grains (broken veins?) ubiquotous. Trace pyrite and chalcopyrite veining.	125	133
1180- 1200		90% med. gray altered porphyritic basalt or andesite A. A. Quartz veins and some terminated quartz crystals (rare) 10% med. gray fine grained tuff. Trace pyrite	120	139
1200- 1220		98% med. gray altered (mildly silicified) basalt or andesite. Quartz veining and open fractures some with terminated quartz crystals. 2% pyrite	129	142
1220- 1240		A. A. Trace red med-fine grain sandstone (sluff)	130	142
1240- 1260		A. A.	136	146

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1260- 1280		87% AA 13% reddish buff colored fine grained calcareous tuff or tuffaceous sandstone Trace chalcopyrite Quartz fracture fillings and some terminated crystals.	136	146
1280- 1300		Medium gray mildly silicified (?) basalt or andesite (porphyritic). Phenocrysts of colorless and white plagioclase. Quartz veining and rare terminated quartz crystals are present. Pyrite is common	138	144
1300- 1320		95% AA (varying degrees of alteration-medium gray to dark gray). 5% reddish buff fine grained tuff Calcite veins; quartz and pyrite veins	138	145
1320- 1380		A. A. (1380-Ubiquotous pyrite and chalcopyrite).	119	142
1380- 1400		Altered basalt or andesite as above. Some black swirls and blebs are probably stretched vesicals filled with chlorite or pumpellyite. Fractures and vesicals are typically lined with chlroite (? dark green) and filled with quartz. Some terminated quartz crystals present. QUARTZ CHLROITE QUARTZ BASALT	119	150
1400- 1420		A. A. Opaline silica, pyrite, calcite and chlorite are present as alteration minerals (vein fillings). White sugary mineral (zeolite?) is present in trace amounts (sampled for X-RAY).	119	153
1420- 1440		A. A.	119	140

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DEPTH	%	LITHOLOGY	MUD TEMPS IN	MUD TEMPS OUT
1440- 1460		95% AA. 5% greenish gray to buff, fine grained tuff. Quite fractured, most fractures filled with amorphous opaline silica and chlorite.	119	149
1460- 1480		AA	120	154
1480- 1500		80% AA 20% reddish-buff, fine grained sandstone	119	142
1500- 1520		50% greenish gray fine grained calcareous tuff 20% reddish buff, calcareous fine grained tuff 15% altered basalt as above 15% black (carbonaceous?) siltstone	136	155
1520- 1540		60% greenish gray fine grained tuff or tuffaceous sandstone (calcareous) 20% reddish-buff fine grained tuff 7% altered basalt or andesite A. A. 5% black carbonaceous siltstone or coal	140	154
1540- 1560		60% greenish gray mildly calcareous fine grained tuff 30% reddish-buff fine grained tuff 8% black siltstone 2% altered basalt A. A. Trace obsidian	124 124	152 150
1560- 1580		80% greenish gray mildly calcareous tuff 17% reddish buff tuff AA 3% black siltstone Trace calcite veining	138	154
1580- 1620		A. A.	130	134
1620- 1640		90% grayish green tuff A. A. 8% buff colored tuff A. A. 1% altered basalt 1% black siltstone	130	144
1640- 1660		30% medium gray to grayish brown tuffaceous sandstone (trace silicification) 40% buff colored, fine grained tuff or tuffaceous micaceous sandstone 25% white to light gray fine grained 5% altered greenish gray basalt (?). Probably sluffed in. Trace of coal	128	150

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DEPTH	%	LITHOLOGY	MUD TEMPS IN	MUD TEMPS OUT
1660- 1680		99% A. A. 1% black shiny coal Trace calcite veining	ND	ND
1680- 1700		30% gray to grayish. Brown calcareous fine grained tuffaceous sandstone. 40% buff colored tuffaceous sandy siltstone with some black laminations. 3% black coal commonly with pyrite coatings 25% white to light gray fine grained tuff (ash?) 2% altered basalt Trace muscovite flakes.	121	153
1700- 1720		AA Trace calcite veins	124	158
1720- 1760		AA.	120	150
1760- 1780		AA (99%) 3% coal sometimes associated with pyrite	120	150
1780- 1800		45% buff colored fine grained siliceous appearing (welded) tuff. 37% medium gray fine grained tuffaceous sands st. 10% fine grained white to light gray tuff or ash 5% altered basalt 3% black coal	146	160
1800- 1820		75% buff, fine grained tuff and welded tuff 15% altered basalt 10% greenish gray fine grained tuff	140	161
1820- 1840		50% altered gray to dark gray to greenish gray porphyritic basalt. 30% greenish grav fine grained tuff (calcareous) 20% buff colored fine grained welded tuff AA. Trace pyrite, calcite veining, obsidian and chlorite (?) veining Trace quartz grains (veining)	140	160
1840- 1860		50% buff colored fined grained welded tuff 30% greenish gray calcareous fine grained tuff 20% greenish gray to dark greenish gray altered basalt [Note: This could be an extensively altered crystal tuff although it appears denser than tuff] Trace of pyrite, calcite	129	158

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DEPTH	%	LITHOLOGY	MUD TEMPS IN	MUD TEMPS OUT
1860- 1880		58% greenish gray tuff 40% buff colored fine grain tuff 2% altered basalt.	130	160
1880- 1900		NO DATA	ND	ND
1900- 1920		85% greenish gray, fine grained crystalline tuff 10% buff colored fine grained welded (?) tuff 5% altered basalt. Trace zeolite	140	158
1920- 1940		60% buff fine grained tuffaceous sandstone 40% greenish gray fine grained tuff	140	162
1940- 1960		60% dark greenish gray to dark gray altered basalt (non-porphyritic) 30% buff colored fine grained sandstone A. A. 10% greenish gray tuff A. A. Trace crystalline quartz) In Basalt Trace opaline silica)	152	160
1960- 1980		60% buff colored fine grained tuffaceous sandstone 38% greenish gray-med. gray tuff 2% black carbonaceous (?) siltstone Trace alt. basalt	148	158
1980- 2000		80% dark greenish gray to black altered basalt with small (1 mm) phenocrysts of plagioclase Trace calcite veining Trace opaline silica 15% buff fine grained tuffaceous sandstone 5% greenish gray fine grained tuff Trace pyrite and chalcopyrite sometimes associated with quartz veining	146	160
2000- 2020		90% dark gray to black basalt Trace calcite veining sometimes associated with chlorite and (zeolites?) CALCITE CHLORITE 8% buff fine grained tuff AA. 2% greenish gray tuff Trace pyrite	151	159

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DEPTH	%	LITHOLOGY	MUD TEMPS IN	MUD TEMPS OUT
2020- 2040		AA Pyrite and quartz veining and fracture fillings as well as some terminated quartz (clusters) crystals indicating partial fracture fillings.	152	164
2040- 2100		AA Calcite veining	150	170
2100- 2120		AA Numerous terminated quartz crystals Trace pyrite	150	170
2120- 2140		97% basalt A. A. 3% buff fine grain tuff (sluff?) Numerous terminated quartz crystals growing in veins on calcite lined fractures CALCITE BASALT TRACE PYRITE	161	174
2140- 2180		98% basalt A. A. 2% buff fine grained sandstone (sluff)	157	166
2180- 2220		AA (2220 numerous terminated quartz x'ls)	162	174
2220- 2240		97% medium gray to dark grayish green basalt 3% calcite and terminated quartz crystals Trace pyrite.	160 fishing string	178
2240- 2260		60% buff to medium gray f. gr. calcareous sandstone 40% grayish green tuff Trace quartz (crystalline) grains.	126	158
2260- 2280		40% buff fine grained sandstone 38% greenish gray altered basalt with quartz and pyrite veining 15% buff to medium gray silicified tuff (welded or baked?) 5% grayish green tuff 2% terminated quartz crystals.	162	174

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DEPTH	%	LITHOLOGY	MUD TEMPS IN	MUD TEMPS OUT
2280- 2300		85% buff to light gray fine grained tuffaceous sandstones and tuffs. 15% grayish green fine grained tuff Trace pyrite mineralization in the brown tuff.	165 Slipped Cable	178 Added 4th Pit
2300- 2320		90% dark greenish gray altered basalt Trace pyrite veins, quartz veining and terminated quartz crystals. 8% buff colored tuffaceous sandstone 2% medium gray fine grained tuff Calcite mineralization.	130	154
2320- 2340		80% basalt AA 10% buff sandstone AA. 10% gray tuff AA.	133	156
2340- 2360		30% buff fine grained sandstone 50% light gray to white to brownish gray, medium grained, calcareous, micaceous crystal tuff, occasionally showing welding 20% gray tuff (welded or mildly silicified) Trace crystalline quartz grains Trace calcite (veining?) grains	147	164
2360- 2380		90% AA 10% dark greenish gray basalt Trace crystalline quartz, some terminated crystals Trace pyrite and calcite	156	166
2380- 2400		AA	151	167
2400- 2420		35% buff fine grained laminated sandstone 45% medium gray to brownish gray to brown, fine to medium grained, mildly silicified or welded tuff 20% light gray micaceous medium grained tuff Trace pyrite, quartz grains and calcite.	150	168
2420- 2440		70% AA 30% dark greenish gray altered basalt (or extensively altered, silicified tuff). Disseminated pyrite locally highly concentrated. Free crystalline terminated quartz grains ubiquotous. Trace opaline silica.	128	158

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440- 2460		A. A.	134	168
460- 2480		90% buff to grayish brown tuff (some welded) 10% medium gray fine grained calcareous tuffaceous sandstone or tuff	140	158
480- 2500		85% AA 15% med. gray to grayish brown med. grained tuff Trace freen calcite grains (veining) Trace x'line qtz grains	135	156
500- 2520		65% buff to medium brown, fine grained occasionally vitric, tuff. (occasionally welded). 35% light brownish gray to medium gray fine to medium grained, mildly to moderately silicified tuff. (Occasionally micaceous) Trace amounts of obsidian, quartz grains (some terminated), zeolites and muscovite flakes.	136	154 236°F 243°F
520- 2540		AA Trace pyrite and quartz veining Trace altered vitric rich tuff.	140	158
540- 2560		A. A.	Loss of circ 120	130