WELL HISTORY REPORT

for

Western Minerals Ltd.

WESTERN MINERALS N HOPE YT N - 53

Yukon

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WESTERN MINERALS N HOPE

YT N - 53

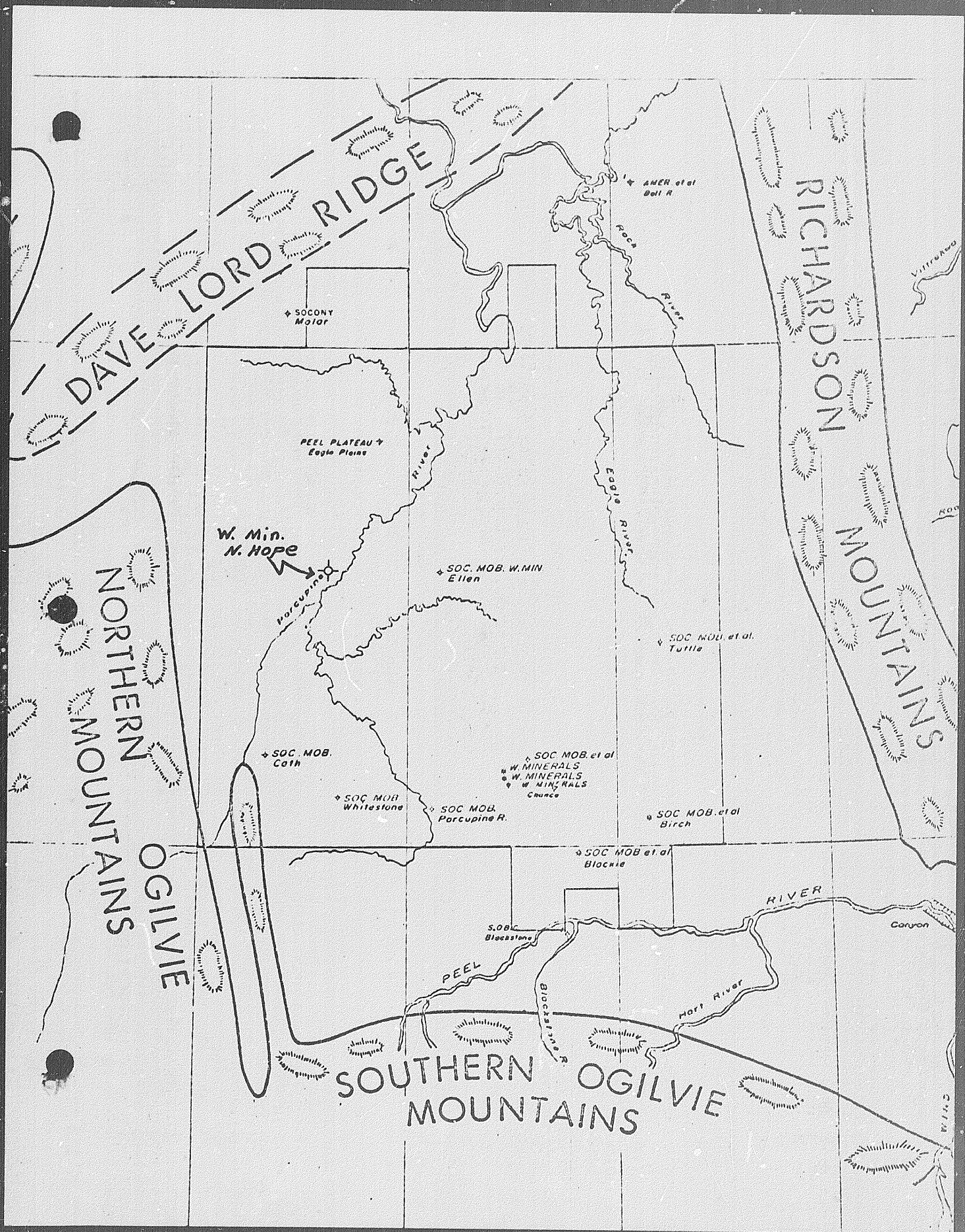
YUKON

Western Minerals Ltd.
Calgary

C. D. Fairburn
Mgr., Western Minerals Ltd.
24 Sept 70

C. D. Gilbreath
R. L. Tedrick, Geologists

April - August, 1970


DAVE LORD RIDGE
RICHARDSON MOUNTAINS
NORTHERN OGILVIE MOUNTAINS
SOUTHERN OGILVIE MOUNTAINS
SOCONY Molar
AMER et al Bell R
Rock River
PEEL PLATEAU Eagle Plains
River
Eagle River
W. Min. N. Hope
Porcupine
SOC. MOB. W. MIN Ellen
SOC MOB et al Tuttle
SOC. MOB. Coth
SOC MOB Whitestone
SOC MOB. Porcupine R.
SOC MOB. et al
W. MINERALS
W. MINERALS
W. MINERALS
Caunce
SOC MOB et al Birch
SOC MOB et al Blochie
RIVER
Canyon
SOBC Blackstone
PEEL
Hart River
Blackstone R.

I N D E X

SECTION I SUMMARY OF WELL DATA

(a) Well Name & Number: Western Minerals N Hope YT N-53

(b) Permittee: Western Minerals Ltd.

(c) Operator: Western Minerals Ltd., 901 - 10th Ave., S.W., Calgary 3

(d) Location: Unit N, Section 53, Grid: 66° 40' N & 138° 15' W
Lat. 66° 32' 54" N; Long. 138° 25' 30" W
Universal Well Location Ref.: Lat. 66.54833°N, Long. 138.42500°W
Unique Well Identifier: 300N536640138150

(e) Co-ordinates: 2600' south of SP 112 on Seis. Line 3

(f) Permit No.: 3330, Exploration License No.: 1653

(g) Drilling Contractor: Nabors Drilling Ltd., Rig #1, Oilwell 76

(h) Drilling Authority: #431, March 18, 1970

(i) Classification: Wildcat

(j) Elevation: Ground: 1136', K.B. 1150'

(k) Spudded: April 18, 1970; 9:00 P.M.

(l) Completed Drilling: August 4, 1970; 5:45 A.M.

(m) Total Depth: Schlumberger: 14,031'; Driller: 14,043'

(n) Status: Dry and Abandoned

(o) Rig Released: Aug. 13, 1970,; 4:00 P.M.

(p) Hole Size: 28": 0 - 90', 17½": 90'-1522', 8 3/4": 1522'-14,037',
6 3/16": 14,037'-14,043' KB

(q) Casing: Conductor Pipe: Ran 90' of 20" x 94#, H-40 Conductor Pipe.
Cemented with 320 sax Fondu Cement.
Surface Casing: Ran 49 joints (1529.02') 13 3/8" x 54.5#, ST&C,
K-55 casing. Landed at 1522' KB. Cemented
with 1200 sax Fondu Cement + 1% NaCl in 600 sacks.

SECTION II

(a) FORMATION TOPS

Marker	Electrolog
Spuds in Cretaceous	
Devonian/Bituminous Shale	5966' (-4816)
Middle Devonian	6061' (-4911)
Silurian	8952' (-7802)
Ordovician	10,043' (-8893)
Total Depth: Schlumberger	14,038'
Driller	14,043'

SECTION II

(b) CORED INTERVALS

Core #1: Interval 14,037' to 14,043'
Formation: Ordivician
Recovery: Cut 6', recovered 1.5'

(c) CORE DESCRIPTIONS

Interval	Description
3"	Dolomite;brown black, argillaceous, bituminous, micro-crystalline, very fractured and broken, tight. Abundant random fractures and cracks in-filled with white, medium to coarse, crystalline Dolomite. Grades to a brown black and white Dolomite breccia at base.
10"	Dolomite Breccia; composed of angular fragments of light brown, medium crystalline Dolomite up to 2" long,in a matrix of white, coarse crystalline Dolomite. Tight. Occasional fine to medium, isolated vugs.
5"	Dolomite; light brown, fine to medium crystalline, tight, fractured. Abundant random fractures in-filled with white, coarse crystalline Dolomite. Trace open cracks coated with Pyrobitumen. Rare fine to medium isolated vugs.

Coring Time: Cored 6' in 2¼ hrs.

SECTION II

(d) SAMPLE DESCRIPTIONS

Interval	Description
0 - 80	Clay with gravel
80 - 220	Siltstone; dark gray, argillaceous, dolomitic, with rare Shale; medium to dark gray, silty, micaceous.
220 - 460	Siltstone and Shale, as above, with Sandstone; medium gray, very fine grained, angular, sub-spherital, argillaceous, micaceous, tight.
460 - 930	Shale; dark gray to black, micaceous in part with rare Siltstone, as above. At 750', rare Siltstone; light gray, argillaceous, micaceous.
930 - 1522	Shale; medium to dark gray, micaceous in part, at 1140' with rare lenses of Limestone; light brown, microcrystalline, argillaceous, dense.
1522	Set 13 3/8" surface casing.
1522 - 1710	Shale; black, non-calcareous with shale, dark gray, micaceous, brown, argillaceous.
1710 - 1800	Shale, as above.

SECTION II

(d) SAMPLE DESCRIPTIONS

Interval	Description
1800 - 1900	Shale; dark brown gray, silty, micromicaceous, fissile, platy to flaky.
1900 - 1910	Shale, as above, very dark brown gray. Trace Ironstone.
1910 - 1920	Shale; black, silty, micromicaceous, bituminous.
1920 - 1940	Shale; dark brown gray, silty, micromicaceous, fissile, platy to flaky. Trace Ironstone.
1940 - 1960	Shale, as above. Siltstone; medium to dark gray brown, argillaceous, sandy, micromicaceous, slightly glauconitic.
1960 - 1980	Shale, as above, medium to dark brown gray, very silty. Common Siltstone, as above, very argillaceous. Trace gypsum and siderite.
1980 - 1990	Siltstone; medium to dark brown gray, very argillaceous, micromicaceous. Common Shale; dark brown gray, silty, micromicaceous.
1990 - 2000	Shale; very dark brown gray, very silty, very micromicaceous. Common Siltstone, as above.
2000 - 2010	Shale; brown black, silty, very micromicaceous, chunky. Common Siltstone; light gray, argillaceous, micromicaceous, slightly calcareous. Trace pyrite.
2010 - 2050	Siltstone; light gray to light gray brown, argillaceous, micromicaceous, slightly glauconitic. Common Shale, as above, very dark brown gray. Trace pyrite.
2050 - 2080	Shale, as above, brown black. Common Siltstone, as above.
2080 - 2100	Shale; very dark brown gray, carbonaceous, silty, slightly, micromicaceous, platy and brown black, silty, very micromicaceous, as above.
2100 - 2130	Shale; brown black, silty, very micromicaceous. Common Siltstone; light to medium gray brown, argillaceous, micromicaceous.
2130 - 2160	Shale and Siltstone, as above. Siltstone; common varied.
2160 - 2180	Siltstone, as above. Common Shale, as above.

Interval	Description
2180 - 2190	Shale, as above, bituminous. Common Siltstone, as above.
2190 - 2200	Shale; very dark brown gray to brown black, very silty, micromicaceous. Common Siltstone, as above.
2200 - 2250	Shale; very dark brown gray to brown black, very silty, very micromicaceous. Siltstone; light gray to light gray brown, argillaceous, micromicaceous.
2250 - 2270	Shale, as above, brown and gray black.
2270 - 2350	Shale; very dark brownish gray to gray black, silty, moderately micromicaceous.
2350 - 2390	Shale, as above, slightly micromicaceous.
2390 - 2400	Shale; very dark brown gray to brown black, silty, micromicaceous, bituminous in part, glauconitic in part. Sandstone; light gray brown to salt and pepper, dolomitic, conglomeritic, bituminous in part, fine to very coarse, poor sorted, angular to subrounded Chert and occasional quartz grains well cemented with dolomite, tight. Chert grains; light to medium dark gray. Common finely disseminated pyrite. Abundant Chert pebbles; light to dark gray and greenish gray, subrounded to rounded.
2400 - 2410	Sandstone; light gray brown, kaolinitic, siliceous, silty, very fine to fine, poor sorted, well cemented with kaolin and silica, tight.
2410 - 2420	Sandstone; light gray brown, conglomeritic, silty, slightly dolomitic, very fine to very coarse, poor sorted, angular to subrounded chert grains well cemented with silica and kaolin, tight. Common finely disseminated Pyrite. Trace pyrobitumen staining. Chert grains; light to dark gray and greenish gray.
2420 - 2450	Shale; very dark brown gray, silty, slightly micromicaceous, chunky. Trace Pyrite.
2450 - 2560	Shale, as above, very dark brown gray to black.
2560 - 2570	Shale; very dark brown gray, silty, micromicaceous, fissile, flaky to chunky. Common Siltstone; medium to dark gray brown, argillaceous, micromicaceous.
2570 - 2580	Shale and Siltstone, as above.

Interval	Description
2580 - 2640	Shale; dark brown gray to black, silty, micromicaceous, chunky.
2640 - 2650	Shale; black, silty, chunky.
2650 - 2680	Shale, as above, and dark brown gray, silty, micromicaceous. Common Siltstone; light to medium gray brown, argillaceous, micromicaceous.
2680 - 2710	Shale, very dark brown gray, silty, micromicaceous, chunky.
2710 - 2770	Shale, as above, gray black, fissile, flaky to chunky.
2770 - 2780	Shale, as above. Sandstone; light gray brown to salt and pepper, silty in part, kaolinitic in part, very fine to coarse, poor sorted, angular to subrounded chert grains, well cemented with kaolin and silica, tight, hard.
2780 - 2790	Sandstone; light gray brown, kaolinitic, silty, micromicaceous, very fine to medium, poor sorted, angular to subrounded chert and occasional weathered feldspar grains well cemented with kaolin and silica, tight.
2790 - 2800	Sandstone, as above. Shale, as above.
2800 - 2820	Sandstone; light gray brown to salt and pepper, kaolinitic, silty, micromicaceous, very fine to medium, poor sorted, angular, well cemented with kaolin and silica. Shale; very dark brown gray to black, silty, slightly micromicaceous, chunky.
2820 - 2830	Sandstone, as above, very fine to fine.
2830 - 2840	Sandstone and Shale, as above.
2840 - 2850	Sandstone; light brown, kaolinitic, sideritic in part, micromicaceous, fine to medium, poor sorted, angular to subangular chert and occasional quartz grains cemented with kaolin and silica, tight, slightly friable in part. Trace light green chlorite grains.
2850 - 2860	Sandstone and Shale, as above.
2860 - 2880	Sandstone, as above, silty, very fine to fine grained. Shale, as above.
2880 - 2890	Sandstone; light gray brown to brown, siliceous, kaolinitic, sideritic in part, very fine to medium, poor sorted, angular. well cemented with silica.
2890 - 2900	Sandstone; dark chocolate brown, sideritic, argillaceous, silty, very fine to fine, angular, well cemented with silica and siderite. Trace chlorite grains. Common Shale; brown black, silty, chunky.

Interval	Description
2900 - 2910	Sandstone, as above, siliceous. Shale; black, silty, micromicaceous, fissile in part, chunky.
2910 - 2940	Shale, as above, dark brownish gray to brown black.
2940 - 2950	Shale, as above. Common Sandstone; dark gray brown, very argillaceous, silty, very fine to medium, well cemented with kaolin, tight.
2950 - 2980	Shale, as above.
2980 - 2990	Shale; brown black, silty, slightly micromicaceous, fissile, flaky to chunky.
2990 - 3000	Shale, as above. Trace Sandstone; light gray brown, argillaceous, silty, micromicaceous, very fine to fine, well cemented, tight.
3000 - 3090	Shale; black, silty, micromicaceous, chunky.
3090 - 3120	Shale, as above, very dark brown gray. Common Sandstone; light to medium gray brown, argillaceous, silty, siliceous in part, very fine to fine, poor sorted, light to dark gray and black chert and minor quartz grains well cemented with silica and kaolin, tight. Common Siltstone; light gray brown, argillaceous, sandy.
3120 - 3140	Sandstone; very light gray brown, kaolinitic, silty, very fine to medium, poor sorted, angular to subangular, light to dark gray chert and minor quartz grains well cemented with kaolin and silica, tight. Common white, chalky, altered feldspar fragments. Common Siltstone, as above. Common Shale, as above, very silty.
3140 - 3150	Sandstone, as above, very fine to fine grained. Common Sandstone; dark brown, sideritic, argillaceous, very fine to medium, poor sorted, well cemented with kaolin and siderite. Common Shale, as above.
3150 - 3190	Sandstone; very light gray brown, kaolinitic, very fine to fine grained, poor sorted, light to dark gray chert, common quartz and occasional white weathered feldspar grains well cemented with kaolin and silica, tight. Shale; medium to dark brown gray, silty, micromicaceous, chunky. Common white, siliceous Claystone (Altered Feldspar) Common Siltstone; light gray brown, argillaceous, sandy.
3190 - 3220	Common Sandstone, as above, siliceous, very hard. Shale; very dark brown gray to black, silty, micromicaceous, hard, chunky.

Interval	Description
3220 - 3250	Sandstone, as as above, very fine to medium grained. Shale, as above, Common finely disseminated Pyrite.
3250 - 3260	Sandstone; light gray brown, argillaceous, very fine to medium, poor sorted, angular to subrounded, well cemented with kaolin and silica, tight. Common light to dark gray, subrounded chert pebbles. Shale; very dark brown gray to brown black, silty, micromicaceous.
3260 - 3270	Sandstone; very light gray to light gray brown, siliceous, very fine to medium, poor sorted, light gray chert, clear quartz and occasional white feldspar grains well cemented with silica, tight. Shale, as above.
3270 - 3290	Sandstone, as above, very fine to coarse grained. Common Shale, as above.
3290 - 3320	Sandstone, as above. Shale; light to medium gray brown, silty, micromicaceous, medium soft, fissile.
3320 - 3330	Shale; medium to dark brown gray, silty, micromicaceous, fissile, firm. Common Sandstone; light to medium gray brown and dark brown gray, argillaceous, siliceous, very fine to medium, well cemented with silica, tight. Common Sandstone; dark gray and dark reddish brown, hematitic, quartzitic in part, fine to medium, well cemented, tight. Trace hematite.
3330 - 3340	Shale, as above. Common Sandstone; light gray to light gray brown, siliceous, kaolinitic, very fine to medium, poor sorted, well cemented with silica, tight. Common white siliceous Claystone, as above.
3340 - 3350	Sandstone, as above, fine to coarse grained and conglomeritic. Common light to dark gray chert pebbles. Common white Claystone, as above.
3350 - 3380	Sandstone; light to medium gray brown, argillaceous, silty, siliceous, very fine to fine, well cemented with silica and clay. Shale, as above.
3380 - 3390	Sandstone; very light gray brown, kaolinitic, micromicaceous, silty, very fine to medium, poor sorted, angular to subangular, light to medium gray chert, clear quartz and white feldspar grains and trace green chlorite grains well cemented with kaolin and silica, tight. Shale; medium to dark brown gray, silty, micromicaceous. Common Siltstone; light gray brown, argillaceous, sandy, micromicaceous.

Interval	Description
3390 - 3400	Sandstone, as above.
3400 - 3420	Sandstone, as above. Common Shale, as above.
3420 - 3440	Sandstone, as above, conglomeritic. Common coarse to pebble size, light gray chert and white feldspar grains. Common Claystone; white siliceous (altered feldspar). Common Shale; brown black, micromicaceous, platy to splintery.
3440 - 3460	Sandstone and Shale, as above, chunky. Trace green chlorite grains. Trace Sandstone; dark gray, quartzitic, medium to very coarse, poor sorted, angular, light to dark gray chert, white feldspar and minor clear quartz grains.
3460 - 3480	Sandstone, as above. Shale; brown black, micromicaceous, fissile, flaky to splintery.
3480 - 3490	Sandstone, as above, very fine to fine grained. Shale; dark brown gray to brown black, micromicaceous, chunky.
3490 - 3500	Shale, as above, silty. Sandstone, as above, very argillaceous.
3500 - 3510	Sandstone; very light to medium gray brown, kaolinitic, silty, very fine to medium grained, poor sorted, angular, light to dark gray chert, clear quartz and common white feldspar grains well cemented with kaolin and silica, tight. Common Sandstone; dark gray, quartzitic, fine to medium, poor sorted, subangular chert and qurtz grains cemented with quartz. Common Shale; dark brown gray to black, silty, micromicaceous.
3510 - 3520	Sandstone, as above, light gray brown, kaolinitic. Shale, as above.
3520 - 3550	Shale, as above. Common Sandstone, as above. Trace medium to coarse quartzitic Sandstone, as above.
3550 - 3570	Sandstone; light to medium gray brown, quartzitic, fine to medium, poor sorted, angular to subangular, light to medium gray chert, clear quartz and occasional white feldspar grains well cemented with quartz. Common Shale, as above.
3570 - 3580	Sandstone; medium to dark gray brown, argillaceous, silty, siliceous, very fine to fine, poor sorted, light to dark gray chert and clear quartz grains well cemented with silica, tight. Common Shale, as above.

Interval	Description
3580 - 3600	Sandstone; light gray brown, kaolinitic, fine to coarse, poor sorted, angular, light to medium gray chert, clear quartz and common white feldspar grains well cemented with silica, tight. Common Sandstone; dark gray brown, argillaceous, sideritic, in part, silty, very fine to fine, well cemented with silica and kaolin, tight. Common Shale; very dark brown gray to brown black, silty, chunky.
3600 - 3630	Shale; dark brown gray, silty, micromicaceous, fissile, platy to splintery. Common Sandstone, as above, siliceous.
3630 - 3640	Shale; dark brown gray, silty, micromicaceous, chunky. Common Siltstone; gray brown, argillaceous, sandy, micromicaceous. Common Sandstone, as above.
3640 - 3650	Shale; brown black, micromicaceous, chunky. Sandstone; light gray brown, siliceous, medium to coarse, poor sorted, subangular, light to medium gray chert, clear quartz and occasional feldspar grains well cemented with silica, tight.
3650 - 3660	Shale; gray black, micromicaceous, fissile, flaky to splintery and chunky. Common Siltstone; light gray brown, argillaceous, sandy, micromicaceous.
3660 - 3670	Shale; dark brown gray, slightly silty, slightly micromicaceous, chunky. Common Sandstone, as above (Cavings?)
3670 - 3740	Shale, as above, flaky to splintery and chunky. Common Sandstone, as above.
3740 - 3780	Shale; very dark brown gray to black, silty, slightly micromicaceous, fissile, platy.
3780 - 3800	Shale, as above, chunky.
3800 - 3820	Shale, as above. Sandstone; light to medium gray brown, kaolinitic, argillaceous, silty, very fine to medium grained, poor sorted, light to medium gray chert, clear quartz grains, well cemented with silica.
3820 - 3850	Sandstone; very light gray brown, silty, siliceous, very fine to medium, poor sorted, composed of chert, quartz and feldspar grains, as above. Common Sandstone, as above, reddish brown, sideritic. Common Sandstone; medium gray brown, argillaceous, silty, very fine to medium, well cemented with kaolin and silica. Common Shale, as above.

Interval	Description
3850 - 3930	Shale; dark brown gray, silty, micromicaceous, chunky. Common argillaceous Sandstone, as above (cavings). Common Siltstone; gray brown, argillaceous, sandy, micromicaceous.
3930 - 3980	Shale, as above. Siltstone, as above, grading to very fine to fine silty, argillaceous Sandstone cemented with silica. Sandstone, as above (cavings).
3980 - 4000	Shale; very dark brown gray, silty, slightly, micromicaceous, chunky.
4000 - 4010	Shale; very dark brown gray, silty, micromicaceous, chunky. Common Siltstone; dark gray brown, sandy, argillaceous, micromicaceous.
4010 - 4020	Shale, as above. Common Siltstone, as above. Common Sandstone; light gray brown to salt and pepper, siliceous, silty, argillaceous, micromicaceous, fine to medium, poor sorted, angular to subrounded quartz and light to dark chert grains well cemented with silica, tight. Common very coarse, subrounded chert pebbles.
4020 - 4040	Shale, Siltstone and Sandstone, as above.
4040 - 4050	Shale, as above. Siltstone, as above, medium gray brown. Trace Sandstone, as above.
4050 - 4060	Shale and Sandstone, as above. Common Siltstone, as above.
4060 - 4090	Shale and Siltstone, as above. Trace Sandstone, as above.
4090 - 4100	Shale; gray black, silty, micromicaceous, fissile, platy to splintery and chunky.
4100 - 4120	Shale, as above, dark gray to dark brown gray. Siltstone, as above. Common sandstone; light to medium gray brown, argillaceous, silty, micromicaceous, very fine to fine, well cemented with silica, tight.
4120 - 4160	Shale, as above, gray black. Common Siltstone, as above.
4160 - 4170	Siltstone; medium gray brown, argillaceous, micromicaceous, sandy, cemented with silica.
4170 - 4180	Shale and Siltstone, as above.

Interval	Description
4180 - 4190	Shale, Siltstone and Sandstone, as above.
4190 - 4210	Shale, as above. Common Siltstone, as above. Trace Sandstone, as above.
4210 - 4220	Shale; dark gray, silty, micromicaceous, chunky, fissile and brown black, slightly micromicaceous, chunky. Common Sandstone, as above, light to medium gray brown and salt and pepper. Common Siltstone, as above.
4220 - 4230	Shale; dark brown gray, silty, micromicaceous, chunky. Common Siltstone, as above.
4230 - 4240	Shale, as above.
4240 - 4250	Shale; very dark gray to brown black, silty, micromicaceous, chunky.
4250 - 4270	Shale, as above. Common Siltstone and Sandstone, as above.
4270 - 4290	Shale, as above. Siltstone; medium gray brown, argillaceous, sandy, micromicaceous, cemented with silica.
4290 - 4330	Shale, as above. Common Siltstone, as above.
4330 - 4340	Shale, as above. Common Siltstone, as above. Trace Sandstone; light gray brown, kaolinitic, slightly glauconitic, silty, very fine to fine, well cemented with kaolin, tight. Trace Sandstone, as above. Trace Claystone; white and brown mottled, sandy.
4340 - 4350	Shale, as above. Siltstone; medium to dark gray brown, argillaceous, sandy, micromicaceous, cemented with silica.
4350 - 4380	Shale, as above. Sandstone; medium gray brown, argillaceous, silty, micromicaceous, very fine to medium, poor sorted, angular to subround quartz and chert grains, cemented with silica, tight. Common Siltstone, as above.
4380 - 4400	Shale, as above. Common Siltstone, as above. Trace Sandstone; light gray brown to salt and pepper, argillaceous, slightly bituminous, siliceous, very fine to medium, poor sorted, angular to subangular, well cemented, tight.

Interval	Description
4400 - 4420	Shale, as above. Common Sandstone, as above, very fine to fine grained. Common Siltstone, as above.
4420 - 4430	Sandstone, as above, very fine to coarse grained. Siltstone, as above, Shale, as above.
4430 - 4440	Sandstone, as above, very fine to medium grained. Siltstone, as above, bituminous. Shale; brown black, fissile, splintery to flaky.
4440 - 4470	Sandstone; light gray brown, argillaceous, siliceous, silty, bituminous in part, very fine to medium, poor sorted, well cemented with silica, tight. Common Shale, as above.
4470 - 4480	Shale; very dark gray to gray black, very micromicaceous, fissile, flaky to splintery. Common Siltstone; light to medium gray brown, sandy, argillaceous, micromicaceous, cemented with silica. Trace Sandstone, as above.
4480 - 4490	Shale, Siltstone and Sandstone, as above.
4490 - 4500	Shale, as above. Common Sandstone, as above, very fine to fine grained. Common Siltstone, as above.
4500 - 4510	Shale; dark brown gray, silty, very micromicaceous, chunky, hard. Sandstone; medium to dark gray brown, argillaceous, silty, micromicaceous, bituminous, siliceous in part, very fine to medium, poor sorted, angular to subrounded quartz, chert and occasional feldspar grains well cemented with silica and clay, hard, tight. Common Siltstone; medium gray brown, argillaceous, sandy, micromicaceous, well cemented with silica and clay, hard. Trace Claystone; white and dark brown gray, biotitic, soft. (Altered igneous rock)
4510 - 4520	Shale, as above. Common Sandstone and Siltstone, as above. Trace Claystone, as above.
4520 - 4550	Shale, Siltstone and Sandstone, as above. Trace Claystone, as above.
4550 - 4570	Shale; very dark gray to very dark brown gray, silty, micromicaceous, fissile, platy to splintery and chunky, hard. Common Siltstone, as above, medium to dark gray brown.

Interval	Description
4570 - 4580	Shale, as above. Common Siltstone and Sandstone, as above.
4580 - 4590	Shale, as above, very dark brown gray. Common Siltstone, as above.
4590 - 4640	Shale, as above. Common Siltstone and Sandstone, as above.
4640 - 4680	Sandstone, as above. Common Shale and Siltstone, as above.
4680 - 4720	Sandstone; medium to dark gray brown, argillaceous, silty, siliceous, micromicaceous, very fine to medium, poor sorted, angular to subangular quartz, chert and feldspar grains well cemented with silica and clay, very hard, tight. Common Shale; very dark brown gray to gray black, silty, micromicaceous, chunky, hard. Common white altered feldspar fragments forming a white, siliceous Claystone. Trace Coal at 4710'.
4720 - 4730	Sandstone and Shale, as above. Trace very coarse subrounded chert grains. Trace soft white, weathered feldspar. Trace glauconite and white claystone.
4730 - 4740	Sandstone, as above, bituminous. Shale, as above. Trace pyrobitumen.
4740 - 4750	Sandstone, as above.
4750 - 4760	Shale; dark brown gray, silty, micromicaceous, chunky, hard. Common Sandstone, as above. Common Siltstone; light to dark gray brown, sandy, argillaceous, siliceous, micromicaceous, hard.
4760 - 4780	Shale, as above. Common Siltstone, as above. Trace Sandstone, as above.
4780 - 4800	Shale, as above, very dark brown gray to brown black. Common Siltstone, as above. Trace Sandstone, as above.
4800 - 4810	Sandstone; medium gray brown, siliceous, argillaceous, very fine to medium, poor sorted, angular to subrounded quartz, chert, and weathered feldspar grains well cemented with silica, tight. Common Siltstone and Shale, as above.
4810 - 4820	Shale and Siltstone, as above.
4820 - 4830	Shale and Sandstone, as above.
4830 - 4850	Shale and Siltstone, as above. Trace Sandstone & white Claystone, as above.

Interval	Description
4850 - 4860	Shale, as above. Common Siltstone, as above. Trace white Claystone, as above.
4860 - 4910	Shale; very dark brown gray to brown black, silty, micromicaceous, chunky, hard. Common Siltstone, as above. Trace Sandstone, as above.
4910 - 4930	Shale, as above. Trace Siltstone, as above.
4930 - 4950	Shale, as above. Common Siltstone, as above.
4950 - 4970	Shale; very dark brown gray, silty, micromicaceous, chunky, hard.
4970 - 5000	Shale, as above. Common Siltstone, as above.
5000 - 5010	Shale; very dark brown gray, silty, micromicaceous, chunky, hard. Common Siltstone; light to medium gray brown, argillaceous, micromicaceous, siliceous, hard.
5010 - 5020	Shale, as above. Common Sandstone; medium to dark gray brown, argillaceous, siliceous, micromicaceous, very fine to fine, poor sorted, angular chert and quartz grains well cemented with silica, very hard, tight.
5020 - 5030	Shale, as above. Common Siltstone, as above. Trace Sandstone, as above.
5030 - 5100	Shale; very dark brown gray to gray black, silty, very micromicaceous, carbonaceous in part, fissile, flaky to splintery and chunky. Common Siltstone, as above, sandy.
5100 - 5110	Shale, as above. Common Siltstone, as above. Common Sandstone; light gray brown, argillaceous, micromicaceous, siliceous, very fine to fine, well cemented with silica, very hard, tight.
5110 - 5130	Shale, as above. Common Siltstone, as above. Trace Sandstone, as above.
5130 - 5140	Shale; brown black, silty, micromicaceous, fissile, platy to splintery.
5140 - 5180	Shale; very dark brown gray, silty, very micromicaceous, chunky. Common Siltstone; medium to dark gray brown, argillaceous, micromicaceous, sandy, siliceous, slightly glauconitic in part, hard.

Interval	Description
5180 - 5240	Shale; very dark brown gray, silty, very micromicaceous, fissile, chunky. Common Siltstone; light gray to gray brown, argillaceous, sandy in part, micromicaceous, siliceous, very hard.
5240 - 5280	Shale; medium to dark brown gray, very silty and micromicaceous, hard, chunky. Trace Siltstone, as above. Common white Calcite vein and fracture in-filling.
5280 - 5310	Shale and Common Siltstone, as above. Common white Calcite and clear quartz vein in-fillings. Trace Sandstone; light gray brown to salt and pepper, quartzitic, silty, very fine to medium, poor sorted, angular, well cemented.
5310 - 5360	Shale; very dark brown, gray, silty, micromicaceous, medium hard, chunky. Trace Shale; brown black, bituminous, micromicaceous, medium soft. Trace Siltstone; light to medium gray brown, argillaceous, micromicaceous, siliceous, hard.
5360 - 5400	Shale; medium to very dark brown gray, silty, micromicaceous, hard, chunky in part, fissile, platy. Trace Siltstone, as above.
5400 - 5470	Shale, as above. Common Siltstone, as above. Trace quartz vein in-filling.
5470 - 5530	Shale, as above. Common Siltstone; light to medium gray brown, argillaceous, micromicaceous, medium soft to hard. Trace hard siliceous Siltstone, as above.
5530 - 5570	Shale, as above, medium to dark brown gray. Common Siltstone, as above.
5570 - 5590	Shale, as above, dark brown gray to brown black. Common Siltstone, as above. Trace quartz vein in-filling.
5590 - 5610	Shale, as above, very dark brown gray. Common Siltstone, as above. Trace brown black slickensided Shale.
5610 - 5630	Shale and Common Siltstone, as above.
5630 - 5660	Shale; very dark brown gray, silty, micromicaceous, chunky, hard.
56660 - 5670	Shale, as above. Trace finely disseminated Pyrite.
5670 - 5710	Shale, as above.

Interval	Description
5710 - 5720	Shale; gray black, silty, micromicaceous, chunky, hard.
5720 - 5790	Shale; dark brown gray, silty, very micromicaceous, chunky, hard.
5790 - 5810	Shale, as above, fissile flaky to chunky, hard. Trace Siltstone, as above.
5810 - 5830	Shale, as above.
5830 - 5870	Shale, as above, chunky, hard.
5870 - 5880	Shale; gray black, silty, micromicaceous, chunky to flaky. Common white quartz in-filling as above. Trace Siltstone, as above.
5880 - 5960	Shale; dark brown gray, silty, very micromicaceous, chunky, hard. Common gray black Shale,as above. Trace Siltstone, as above.
5960 - 5970	Shale; very dark brown gray, silty, very micromicaceous, chunky. Common Shale; brown black, slightly silty, slightly micromicaceous, bituminous, chunky.
5970 - 5990	Shale; brown black, bituminous, slightly silty and micromicaceous, chunky. Common finely disseminated Pyrite.
5990 - 6000	Shale, as above, gray black.
6000 - 6010	Shale; gray black, bituminous, slightly micromicaceous, fissile, flaky to chunky, medium hard.
6010 - 6050	Shale as above. Trace pyrobitumen and pyrite.
6050 - 6060	Shale; soot black, bituminous, cherty, slightly micromicaceous, chunky. Abundant Chert; jet black, shiny, sub-vitreous. Common Limestone; white, chalky, and white and brown mottled, argillaceous in part, micro-fragmental with earthy to chalky matrix, tight.
6060 - 6070	Limestone; gray white and light tan to dark gray brown mottled, argillaceous, microfragmental, and earthy, tight. Common Limestone; white to cream, chalky to microcrystalline, tight. Common Shale and Chert, as above.
6070 - 6080	Limestone, as above. Common white chalky to earthy Limestone.
6080 - 6100	Limestone; white and light tan to brown mottled, microfragmental with a cryptocrystalline to earthy matrix, tight.

Interval	Description
6080 - 6100	(cont'd.) Common white chalky Limestone. Abundant Shale, as above.
6100 - 6110	Limestone, as above with a chlky to earthy matrix, tight.
6110 - 6120	Limestone, as above, white and light gray tan mottled. Common white, chalky Limestone.
6120 - 6130	Limestone, as above, white and medium to dark gray tan mottled, argillaceous in part, tight. Common white chalky Limestone.
6130 - 6140	Limestone; very light gray brown, microfragmental, earthy to cryptocrystalline, no effective porosity. Common Limestone; dark gray brown, commonly mottled light and dark gray brown, argillaceous, siliceous, cryptocrystalline, dense, hard. Trace white Calcite.
6140 - 6150	Limestone, as above. Common Calcite fracture in-filling. Tight.
6150 - 6160	Limestone, as above, commonly stycolitic, fractured, tight. Common slickensided pieces lined with calcite indicating fractures in-filled with calcite. Common Calcite, tight.
6160 - 6170	Limestone, as above. Common Shale; brown black, calcareous, bituminous in part, blocky to chunky, hard.
6170 - 6190	Limestone, as abcve. Common Shale, as above. Abundant white calcite fracture in-filling. Common white chalky Limestone.
6190 - 6210	Limestone; very dark gray brown, commonly mottled, argillaceous, siliceous, cryptocrystalline, dense, hard. Limestone; light to medium gray brown, commonly mottled light and dark gray brown, argillaceous, microfragmental in part, earthy to chalky and cryptocrystalline, tight. Common white calcite vein and fracture in-filling. Common Shale, as above.
6210 - 6220	Limestone; light to medium gray brown, argillaceous, microfragmental, chalky to earthy, soft, tight. Limestone; dark gray brown to black, argillaceous, cherty, siliceous, cryptocrystalline, dense, very hard. Common Limestone; mottled light and dark gray brown, composed of above limestones intermixed. Common Chert; brownish to jet black, calcareous, subvitreous. Trace Calcite.

Interval	Description
6220 - 6250	Limestone; light to medium gray brown, microfragmental, as above. Common brown to black and mottled Limestone, as above. Trace Chert, as above. Common white Calcite vug and fracture in-filling. Trace Shale; brownish to soot black, bituminous, calcareous, chunky, Fossil ostracods and crinoids.
6250 - 6260	Limestone, as above, cherty. Abundant Chert; dark gray tan to brown black, vitreous. Trace Shale, as above. Trace Calcite.
6260 - 6270	Limestone as above, very cherty. Common Shale, as above. Abundant Chert, as above. Common white calcite in-filling.
6270 - 6280	Limestone, as above, slightly cherty. Common Shale, as above. Trace Chert, as above. Common Calcite,. Fossil brachiopods.
6280 - 6290	Cavings.
6290 - 6300	Limestone; very light gray brown becomes mottled light and dark gray brown in part, microfragmental, chalky to earthy and cryptocrystalline, tight. Abundant Limestone; very dark gray brown, argillaceous, siliceous, crypto to microcrystalline, dense, very hard. Trace Chert; very dark gray tan, vitreous. Common Calcite.
6300 - 6310	Limestone; very dark gray brown, argillaceous, siliceous, cryptocrystalline, dense, very hard, brittle. Common Shale; soot black, slightly calcareous, bituminous, blocky. Trace Chert, as above. Common light gray brown, microfragmental Limestone, as above. Trace Calcite.
6310 - 6330	Limestone; light gray brown, microfragmental and dark gray brown, argillaceous, siliceous, as above, becomes mottled and intermixed in part. Common Calcite vug and fracture in-filling. Common Shale, as above. Appears to be brecciated and recemented with Calcite.
6330 - 6350	Limestone; light gray brown, microfragmental, chalky to earthy, as above. Common Limestone; very dark gray brown, argillaceous, siliceous, as above. Common Calcite vug and fracture in-filling. Trace Shale, as above.
6350 - 6370	Limestone, as above, cherty. Common Chert; very dark gray tan to black, vitreous. Common Calcite, as above. Trace Shale, as above.

Interval	Description
6370 - 6400	Limestone; light gray brown, microfragmental, cryptocrystlline to chalky and earthy, tight, commonly mottled and intermixed with dark gray brown, argillaceous, siliceous Limestone, as above. Common Calcite, as above. Fossil Ostracods. Trace Calcite; medium crystalline with interstitia' pyrobitumen. Note: Limestone appear to have been brecciated and re-cemented with Calcite.
6400 - 6500	Limestone, as above, cherty. Common Chert, as above. Common Calcite, as above. Trace black bituminous Shale, as above. Trace Calcite; medium to coarse crystalline as above with interstitial pyrobitumen. Appears brecciated as above.
6500 - 6520	Limestone; very dark gray brown, argillaceous, siliceous, cryptocrystalline, dense, brittle. Common microfragmental Limestone, as above. Trace Chert and black Shale, as above. Common Calcite fracture in-filling.
6520 - 6580	Limestone; light gray brown, microfragmental, chalky to earthy, tight. Commonly mottled and intermixed with dark gray brown, argillaceous, siliceous Limestone, as above. Common Calcite fracture in-filling. Appears to be brecciated. Trace Chert and black Shale, as above.
6580 - 6640	Limestone; dark gray brown, argillaceous, siliceous, crypto-t crystalline, dense, very brittle. Common Limestone; light gray brown, microfragmental, chalky to earthy, tight, commonly mottled and intermixed with dark gray brown Limestone, as above. Appears brecciated and re-cemented with calcite in part. Trace Chert, as above.
6640 - 6650	Limestone; light gray brown, microfragmental, chalky, light and dark gray brown, argillaceous, siliceous, as above. Common Calcite. Probably fractured and re-cemented with Calcite.
6650 - 6680	Limestone;dark gray tan to dark gray brown, argillaceous, siliceous, cryptocrystalline to lithographic, dense, brittle. Common Limestone; gray white to very light gray brown, chalky to cryptocrystalline, tight, becomes mottled and intermixed with the dark gray brown Limestone, as above, in part. Trace Calcite in-filling.
6680 - 6700	Limestone; as above, fractured, stylolitic. Fractures in-filled with Calcite and coated with pyrobitumen in part. Some black pyrobituminous Limestone. Becomes mottled and intermixed in part, probably brecciated. Common Calcite.

Interval	Description
6700 - 6730	Limestone, as above. Trace Shale; gray to brownish black, calcareous, bituminous, chunky. Common medium to coarse crystalline calcite on fracture faces. No apparent intercrystalline porosity.
6730 - 6740	Limestone; dark gray tan to dark gray brown, argillaceous, bituminous, crypto to microcrystalline, dense, hard, commonly mottled and intermixed with gray-white to light gray brown, chalky to earthy Limestone. Common Limestone; light gray brown, microfragmental, chalky to earthy, tight. Common calcite fracture in-filling.
6740 - 6770	Limestone, as above, siliceous, and very dark brown gray to black, bituminous, argillaceous, siliceous, crypto to microcrystalline, dense, brittle, becomes mottled and intermixed with chalky to earthy Limestone as above, tight. Appears fractured, brecciated and calcite in-filled. Trace Chert; dark gray tan to black, calcareous, subvitreous. Common Calcite. Trace Shale; black, bituminous.
6770 - 6780	Limestone; gray white and dark gray brown mottled, micro to fine fragmental, chalky, bituminous, and minor brown black, argillaceous, bituminous, siliceous Limestone, as above, fractured, brecciated, tight. Fractures commonly in-filled with bitumen and calcite. Common coarse crinoid fragments.
6780 - 6790	Limestone, as above, fine to medium, fragmental, fossiferous, chalky to earthy. No effective porosity. Common Crinoid fragments.
6790 - 6820	Limestone, as above, crinoidal. Common slickensided pieces. Common Calcite.
6820 - 6830	Limestone; gray white and dark gray tan to brownish black mottled, fine to medium fragmental, chalky to earthy and cryptocrystalline, brecciated, tight. Common Limestone; brown black, argillaceous, siliceous, bituminous, crypto to microcrystalline, dense, commonly intermixed with Limestone, as above. Common Calcite in-filling. Common Crinoids.
6830 - 6850	Limestone; dark gray brown to brownish black, argillaceous, siliceous, bituminous, hard, brittle, commonly intermixed and mottled with gray white chalky to earthy, fine to medium, fragmental Limestone, as above, brecciated and calcite in-filled. Common slickensided pieces. No apparent porosity.
6850 - 6860	Limestone; light gray brown, micro to fine fragmental, chalky to earthy, tight, commonly mottled and intermixed with dark gray brown, argillaceous, siliceous Limestone, as below. Limestone; very dark gray brown, argillaceous, slightly siliceous, bituminous, cryptocrystalline, dense, hard, brittle. Trace Calcite.
6860 - 6870	Limestone; light gray brown, fine to medium fragmental, chalky

Interval	Description
6860 - 6870	(cont'd.) to earthy, as above with abundant crinoid fragments Common dark gray brown Limestone, as above. Common Calcite fracture and occasional vug in-filling.
6870 - 6890	Limestone; dark gray tan, siliceous, lithographic, hard, brittle. Common gray white, chalky Limestone. Trace Calcite.
6890 - 6910	Limestone; gray white to light gray brown. micro to fine fragmental, chalky, commonly mottled and intermixed with very dark gray brown, argillaceous, slightly siliceous, cryptocrystalline, dense, brittle Limestone. Common dark gray brown, dense Limestone, as above. Trace Shale; brown black, calcareous, bituminous, blocky. Common Calcite. Trace Pyrite. Trace crinoids and ostracods.
6910 - 6920	Limestone, as above. Abundant Calcite; white to very light gray tan, microcrystalline. C Common dark brown Limestone, as above. Trace Shale, as above. Trace ostracods and crinoids.
6920 - 6950	Limestone; medium gray brown, medium to coarse fragmental, cryptocrystalline to chalky, tight. Common very dark gray brown, argillaceous Limestone, as above. Trace Shale, as above. Trace Calcite. Abundant crinoid fragments. Trace ostracods. Trace Shale ; black bituminous, pyritic in part, chunky.
6950 - 7020	Limestone; gray white to light gray brown, micro to fine fragmental, chalky to earthy, tight. Commonly mottled and intermixed with very dark gray brown to brown black Limestone, as above. Common crinoid fragments. Common Calcite. Trace black Shale, as above.
7020 - 7090	Limestone, as above with common slickensiding. Appears brecciated. Common Calcite. Trace black Shale, as above. Common Crinoids.
7090 - 7150	Limestone; gray white to light gray brown and very dark gray brown mottled, common intermixed, fine to medium fragments, chalky to earthy, tight. Abundant Limestone; very dark gray brown, argillaceous, slightly siliceous, crypto to microcrystalline, dense, hard, brittle. Common Calcite vein and fracture in-filling. Trace Crinoids; Trace Shale; brown black, calcareous, bituminous, chunky. Trace fine to medium crystalline Calcite. Trace slickensiding.

Interval	Description
7150 - 7200	Limestone, as above, micro to very fine fragmental, chalky to earthy and cryptocrystalline. Abundant very dark gray brown to brown black Limestone, as above. Common Calcite. Trace crinoids and ostracods. Trace Shale; black, bituminous, slightly micromicaceous, chunky.
7200 - 7220	No Sample. Cavings from trip for bit and reaming.
7220 - 7260	Limestone, as above, fine to medium fragments. Abundant dark gray brown to black, argillaceous, cryptocrystalline Limestone, as above. Common black Shale, as above. Common Calcite vein and fracture in-filling.
7260 - 7270	Limestone; gray white to very light gray brown, micro to fine fragmental, cherty to earthy, mottled as above in part. Common dark brown to black Limestone, as above. Trace black Shale, as above. Common Calcite in-filling. Trace Shale; medium to dark gray brown, silty, micromicaceous, fissile, medium soft.
7270 - 7330	Limestone; white and light to dark gray brown mottled, fine to medium fragments, chalky and cryptocrystalline, tight. Common Limestone; brown black, argillaceous, cryptocrystalline, hard, brittle. Common black Shale, as above. Common Calcite, as above.
7330 - 7340	Limestone, as above, fractured. Abundant Limestone; brown black, argillaceous, bituminous in part, siliceous, cryptocrystalline, dense, very hard, brittle. Abundant white Calcite fracture in-filling. Common slickensiding.
7340 - 7370	Limestone; white and light to dark gray brown mottled and intermixed, very fine to medium fragments, chalky to earthy, tight. Limestone; very dark gray brown, argillaceous, siliceous, lithographic to cryptocrystalline, dense, very hard, brittle, commonly intermixed with the fragmental limestone, as above. Trace brown black Limestone, as above. Trace black bituminous shale partings. Common Calcite.
7370 - 7400	Limestone, as above. Common brown black Limestone, as above. Common Shale; black, bituminous, slightly micromicaceous, blocky. Common Calcite.
7400 - 7410	Fragmental Limestone, as above, very light to dark gray brown, with a chalky to earthy and microcrystalline matrix.

Interval	Description
7400 - 7410	(cont'd.) Tight. Limestone; very dark gray brown to brown black, argillaceous, siliceous, bituminous in part, cryptocrystalline, dense, very hard, brittle. Trace black shale, as above. Common Calcite in-filling.
7410 - 7430	Limestone; gray white and very light to dark gray brown, mottled, very fine to medium fragments, chalky to earthy, tight. Limestone; light gray brown, argillaceous, lithographic, hard, brittle. Common dark gray brown to black argillaceous Limestone, as above. Trace black Shale, as above. Trace Calcite.
7430 - 7450	Limestone, as above with an earthy to microcrystalline matrix in part. Trace very poor intercrystalline porosity. Common Limestone; light gray brown, argillaceous, lithographic, as above and brown black, argillaceous, siliceous, crypto-crystalline, as above. Trace black bituminous Shale partings. Trace Calcite.
7450 - 7460	Limestone; very light and very dark gray brown, mottled, bituminous, argillaceous in part, microcrystalline with traces very poor intercrystalline porosity. Common fragmental Limestone, as above. Common brown black Limestone, as above. Trace black Shale, as above. Common Calcite small vug and vein in-filling.
7460 - 7470	Limestone; light to very dark gray brown to brown black, argillaceous, bituminous, microcrystalline, dense, hard. Common Limestone; very light gray brown, lithographic. Trace gray white chalky Limestone. Trace Calcite.
7470 - 7480	Limestone, as above with traces pin point vugs. Common Limestone; gray white to very light gray brown, micro-fragmental, chalky to earthy.
7480 - 7490	Limestone, as above, tight.
7490 - 7500	Dolomite; very light gray brown, argillaceous, cryptocrystalline, dense. Limestone; very dark gray brown to black, bituminous, dolomitic, argillaceous, crypto to microcrystalline, dense, hard, brittle. Common fine fragmental Limestone, as above. Trace black Shale, as above.
7500 - 7510	Dolomite, as above and Dolomite; light to dark gray brown and black, bituminous, argillaceous in part, microcrystalline, dense. Common fragmental Limestone, as above. Common Calcite.

Interval	Description
7510 - 7520	Limestone; white and light to dark gray brown mottled, chalky to earthy and microcrystalline, tight. Common Limestone; dark gray brown to black, argillaceous, bituminous, crypto to microcrystalline. Common Calcite.
7520 - 7530	Limestone; gray white and light to dark brown mottled, argillaceous, fine fragmental, chalky to earthy and microcrystalline, tight. Dolomite; brown black, very argillaceous, bituminous, microcrystalline, dense. Common Limestone; medium to dark gray brown, lithographic. Trace Siltstone; light gray, calcareous. Common Calcite vein in-filling. Trace Shale; brown black, bituminous, dolomitic, slightly micromicaceous, chunky to blocky.
7530 - 7560	Limestone and Dolomite, as above. Common black Shale, as above. Common Calcite vein in-filling. Fossil Ostracods. Common Limestone; very light gray brown, argillaceous, cryptocrystalline and marly.
7560 - 7580	Limestone and Dolomite, as above, brecciated. Abundant fracture and vein in-filling. Trace black Shale, as above. Common Limestone; very light gray brown, argillaceous, cryptocrystalline and marly.
7580 - 7590	Limestone; light gray brown, argillaceous, marly, cryptocrystalline to earthy and gray white to gray brown, fine fragmental, chalky to earthy, tight. Brecciated, as above. Abundant Calcite. Common brown black Dolomite, as above.
7590 - 7600	Limestone, as above, very brecciated. Abundant Calcite (50%) fracture and vein in-filling.
7600 - 7610	Limestone and Calcite, as above, brecciated. Common Limestone; light gray brown to tan, lithographic.
7610 - 7630	Limestone; light to dark gray brown, dolomitic, crypto to microcrystalline, dense, brecciated. Limestone; gray white and light to dark gray brown, micro to very fine fragmental, chalky to earthy. Abundant Calcite. Common Shale; brown black, calcareous, bituminous, chunky. Common Limestone; very light brown gray, argillaceous, marly in part, cryptocrystalline.
7630 - 7650	Limestone; very light brown gray, argillaceous, cryptocrystalline, as above and very light to dark gray brown, fine fragmental, chalky to earthy, as above. Dolomite; dark gray brown to brown black, argillaceous, bit-

Interval	Description
7630 - 7650	(Cont'd.) uminous, microcrystalline, tight. Common Calcite vein and fracture in-filling.
7650 - 7660	Fragmental Limestone, as above. Common Dolomite, as above. Trace Calcite.
7660 - 7670	Limestone, as above, siliceous, micromicaceous, fine to medium fragmental and very dark gray brown to black, argillaceous, siliceous, cryptocrystalline, dense, hard, brittle. Common Siltstone; very light brown gray, calcareous, micromicaceous. Abundant Calcite, brecciated.
7670 - 7680	Fragmental Limestone, as above. Common Limestone; very light gray brown, argillaceous, crypto- to micro crystalline, dense, medium hard to soft. Common brown to black, cryptocrystalline Limestone, as above. Trace Calcite.
7680 - 7700	Limestone, as above. Common Shale; black, calcareous, bituminous, chunky, hard. Common Calcite, brecciated.
7700 - 7710	Limestone; very light gray brown, argillaceous, cryptocrystalline, medium hard becomes marly, soft in part and siliceous, micromicaceous in part. Common Limestone, as above. Common ostracods.
7710 - 7720	Dolomite; dark brown gray to black, argillaceous, siliceous, calcareous, bituminous, microcrystalline, dense, hard. Common light gray brown and fragmental Limestone, as above, brecciated. Common Calcite vein and vug in-filling. Common black Shale.
7720 - 7740	Fragmental Limestone, as above, very fine to medium, chalky to cryptocrystalline. Common black Dolomite, as above. Common Shale; black, bituminous, slightly micromicaceous, chunky, hard. Common light tan cryptocrystalline Limestone. Common Calcite.
7740 - 7750	No Sample.
7750 - 7770	Fragmental Limestone and Dolomite; very dark gray brown to black, argillaceous, siliceous, bituminous, microcrystalline, tight. Trace Limestone; light gray, silty, microcrystalline. Trace Siltstone; light gray,calcareous. Common Calcite.

Interval	Description
7770 - 7810	Limestone; light gray to very light gray brown, dolomitic, earthy, tight. Dolomite; very dark gray brown to brown black, argillaceous, siliceous, microcrystalline, very hard, dense, brittle. Common Shale; black, bituminous.
7810 - 7820	Limestone; light to medium gray tan, cryptocrystalline, dense, brittle. Common Limestone; gray white and medium to dark gray brown, fine to medium fragmental, chalky, tight. Common Dolomite, as above. Common Calcite.
7820 - 7830	Limestone, as above. Common Calcite vein and fracture in-fillings. Trace Dolomite and black Shale, as above.
7830 - 7840	Limestone; white to very light gray brown, dolomitic in part, microfragmental in part, chalky to earthy and cryptocrystalline. Limestone; light to medium tan, cryptocrystalline, dense, hard, brittle. Abundant Calcite vein and fracture infilling.
7840 - 7850	Limestone, as above. Dolomite; very dark gray tan to dark gray brown, argillaceous, microcrystalline, dense. Trace Shale; black, bituminous, chunky, blocky hard. Abundant Calcite, as above, brecciated.
7850 - 7870	Dolomite, as above, bituminous, brecciated. Abundant Calcite in-filling. Common Limestone; light gray brown, microfragmental, chalky to earthy, soft, tight. Trace black bituminous Shale, as above.
7870 - 7880	Dolomite, as above, very dark gray brown to black. Common Limestone; light tan, crypto to microcrystalline, tight. Common Limestone, as above, brecciated. Abundant Calcite in-filling. Trace black Shale, as above.
7880 - 7890	Limestone; light to medium gray tan, lithographic, hard, brittle. Common Limestone and Dolomite, as above. Common Calcite.
7890 - 7900	Limestone and Dolomite, as above, brecciated. Trace black Shale. Common Calcite.

Interval	Description
7900 - 7920	Limestone; light to medium gray tan, cryptocrystalline to lithographic, hard, fractured. Common Dolomite and fragmental Limestone, as above, brecciated. Abundant fracture and vein in-filling with Calcite.
7920 - 7930	Dolomite; dark gray brown to brown black, bituminous, argillaceous, microcrystalline, dense, hard, tight. Limestone, as above, brecciated. Common Calcite.
7930 - 7940	Dolomite, as above, fractured and brecciated. Abundant Calcite.
7940 - 7950	Dolomite, as above. limestone; light gray brown, argillaceous, marly, earthy to chalky, microfragmental in part, becomes medium to dark gray brown, argillaceous, crypto to microcrystalline in part. Common Calcite. Trace black bituminous Shale.
7950 - 7960	Limestone; very light to dark gray brown, argillaceous, marly in part, microfragmental, chalky to earthy, tight. Dolomite, as above, crypto to microcrystalline, dense, hard. Trace black Shale, as above. Common Calcite.
7960 - 7970	Dolomite, as above. Common Limestone, as above. Common Calcite.
7970 - 7980	Dolomite, as above, calcareous, very argillaceous. Common Limestone, as above. Common Calcite. Trace dark Shale.
7980 - 7990	Dolomite, as above. Common Limestone, as above, brecciated. Abundant Calcite.
7990 - 8000	Limestone; brown black, argillaceous, very bituminous, siliceous, hard, brittle, and light gray to light gray brown and black mottled, bituminous, argillaceous, marly in part, earthy to chalky, very fractured, slickensided in part, brecciated. Common Shale; brown black, bituminous, silty in part, blocky. Abundant Calcite vein and fracture in-filling. Common pyrobitumen in-filling. (Fault zone?)
8000 - 8010	Dolomite; very dark gray brown to brown black, argillaceous, bituminous, calcareous, microcrystalline, tight. Limestone; light gray brown and brown black, mottled, bituminous, argillaceous, micro to fine fragmental, earthy to chalky, and microcrystalline, tight. Common Calcite.

Interval	Description
8010 - 8020	Dolomite, as above. Common Limestone, as above, earthy to microcrystalline. Abundant Calcite vein and fracture in-filling. Common Pyrobitumen and black Shale, as above, brecciated.
8020 - 8030	Limestone, as above, with poor earthy and microvug porosity. Limestone; light tan to dark gray tan, cryptocrystalline, dense, brittle. Common Dolomite, as above. Common Calcite. Trace black Shale, as above, fractured and slickensided.
8030 - 8050	Dolomite; medium to dark gray brown, and brown black, calcareous, siliceous, bituminous, microcrystalline, hard, tight. Common Calcite.
8050 - 8070	Dolomite, as above. Trace microvugs. Trace Calcite. Trace medium to coarse, white Dolomite crystals. Possible open fractures.
8070 - 8090	Dolomite; buff to dark gray brown, microcrystalline with trace microvug porosity. Common Dolomite; brown black, bituminous, microcrystalline, tight. Trace white, medium crystalline Dolomite vug in-filling, with traces intercrystalline porosity, clusters of white Dolomite crystals commonly coated with pyrobitumen. Trace Calcite vug and vein in-filling. No stain, fluorescence, or cut.
8090 - 8100	Dolomite; dark gray brown to brown black, bituminous, microcrystalline, tight. Common buff to dark gray brown, microcrystalline Dolomite, as above, with traces white, medium crystalline cluster dolomite. Trace intercrystalline porosity. No stain, fluorescence or cut.
8100 - 8110	Dolomite; dark gray brown, bituminous, microcrystalline with trace pinpoint to small vug porosity. Trace white, medium crystalline Dolomite vug in-filling, as above.
8110 - 8120	Dolomite, as above with rare pinpoint vug porosity. Traces intercrystalline porosity, as above. Common Limestone; light to medium gray tan, lithographic. Common Limestone; light to dark gray brown, mottled, micro to fine fragmental, cryptocrystalline to chalky, tight. Common Calcite, vein and vug in-filling.
8120 - 8130	Dolomite; light buff, microcrystalline, dense. Common Dolomite; dark gray brown, argillaceous, bituminous, microcrystalline, dense. Sample mostly cavings.

Interval	Description
8130 - 8150	Dolomite; dark gray brown, argillaceous, bituminous, dense, as above. Mostly cavings.
8150 - 8170	Dolomite; very light buff, microcrystalline, dense. Common dark gray brown Dolomite, as above. Trace white, chalky Dolomite.
8170 - 8180	Dolomite, as above. Common white to cream, chalky to earthy Dolomite. Trace patchy, fine to medium crystalline Dolomite, common in clusters (vug lining or in-filling) with interstitial pyrobitumen. Trace microvugs.
8180 - 8220	Dolomite; light buff, crypto to microcrystalline, dense and dark gray brown, argillaceous, bituminous, microcrystalline, tight. Common Dolomite; white to cream, chalky to earthy. Common Shale; brown black, bituminous, chunky, becomes dark gray brown, micromicaceous, fissile in part. Trace calcite vein in-filling. Trace white, fine to medium crystalline dolomite, infilling. Trace pyrobitumen.
8220 - 8240	Dolomite; dark gray brown, bituminous, microcrystalline with traces patchy poor intercrystalline porosity commonly in-filled with pyrobitumen. Trace white, fine to medium, crystalline dolomite vug lining, with traces intercrystalline porosity. Rare pinpoint vugs. Crystals lined with pyrobitumen. No apparent permeability.
8240 - 8250	Dolomite, as above, very fine to fine crystalline with intercrystalline porosity generally plugged with pyrobitumen. No apparent permeability.
8250 - 8270	Dolomite, as above with fine intercrystalline and pinpoint vug porosity. Very poor to no apparent permeability due to pyrobitumen in-filling.
8270 - 8280	Dolomite; buff to dark gray brown, micro to very fine crystalline, bituminous, with poor intercrystalline and pinpoint vug porosity. No apparent permeability due to pyrobitumen in-filling. Common white Calcite vein in-filling.
8280 - 8300	Dolomite, as above, tight. Common Calcite.
8300 - 8320	Dolomite, as above. Abundant Shale, cavings.
8320 - 8340	Dolomite, as above, crypto to microcrystalline. Trace Shale; light to dark gray brown, silty, micromicaceous, slightly dolomitic, fissile. Common Calcite and cream chalky Limestone.

Interval	Description
8340 - 8360	Dolomite; light buff, microcrystalline, tight. Common Calcite. Trace Shale; brown black, slightly micromicaceous, bituminous.
8360 - 8370	Dolomite; light buff, calcareous, crypto to microcrystalline, dense. Limestone; light to medium gray tan, lithographic.
8370 - 8380	Dolomite and Common Limestone, as above. Dolomite; very dark gray tan, argillaceous, siliceous, crypto- to microcrystalline, dense, very hard.
8380 - 8390	Dolomite; light buff, crypto to microcrystalline, dense and medium to dark gray and gray tan, argillaceous, siliceous, commonly bituminous, silty in part, crypto to microcrystalline, dense, hard. Common Shale; brown black, bituminous, micromicaceous, silty in part. Brecciated in part. Common white chalky Limestone.
8390 - 8410	Dolomite; light buff, crypto to microcrystalline, as above. Common dark gray to dark gray tan.Dolomite, as above. Common white, chalky Limestone. Common Limestone; light tan, lithographic. Trace Siltstone; very light gray tan, calcareous. Common Shale, as above.
8410 - 8420	Dolomite, as above, siliceous. Common Siltstone; white to very light gray, calcareous grading to light gray, silty Limestone.
8420 - 8430	Dolomite; light buff, micro to fine crystalline, dense and light gray to gray tan and dark gray brown, argillaceous, silty, siliceous, bituminous in part, microcrystalline, dense, hard. Common white chalky Limestone in-filling. Trace Calcite.
8430 - 8450	Limestone; light gray to very light gray tan, siliceous, silty, dolomitic, microcrystalline, tight. Siltstone; white to very light gray tan, calcareous.
8450 - 8460	Limestone and Siltstone, as above. Common Limestone; very light tan, lithographic. Common Shale; very light gray green, calcareous, waxy, soft. Common Calcite.
8460 - 8480	Limestone; very light tan, lithographic, as above. Common Shale, as above. Common Limestone; dark gray brown, argillaceous, cryptocrystalline. Common white chalky Limestone. Common Calcite.

Interval	Description
8480 - 8500	Limestone; very light gray tan, lithographic, as above. Common Shale, as above; light gray green to dark green. Common Limestone; white and dark gray brown, fine fragmental, chalky. Common white chalky Limestone.
8500 - 8540	Limestone; light tan, lithographic to cryptocrystalline, dense, and white chalky, becomes micro to fine fragmental in part. Common partings of Shale; light to dark emerald green, waxy, medium hard. Trace Calcite.
8540 - 8560	Limestone, as above. Common light green waxy Shale partings. Trace finely disseminated pyrite. Trace Calcite.
8560 - 8570	Limestone, as above. Trace light green Shale, as above. Trace Dolomite; dark gray brown, microcrystalline, tight. Trace Shale; brown black, dolomitic, bituminous. Common Calcite.
8570 - 8580	Limestone, as above. Dolomite; medium to dark gray brown, argillaceous, siliceous, microcrystalline, hard, brittle. Common Dolomite; gray white to light brown, siliceous, micro to fine crystalline, sucrosic, tight. Trace light green Shale, as above. Trace pyrobitumen and pyrite.
8580 - 8590	Dolomite; white to light brown, siliceous, micro to fine crystalline, sucrosic, tight. Dolomite; light to dark gray tan, siliceous, lighographic to cryptocrystalline, dense, hard, brittle. Common Dolomite; medium to dark gray brown, argillaceous, siliceous, crypto to microcrystalline, dense. Common white, chalky Limestone. Trace Siltstone; white, dolomitic. Trace Pyrite.
8590 - 8600	Dolomite; medium to dark brown, siliceous, argillaceous in part, crypto to microcrystalline, dense. Common Pyrite. Trace light green, waxy Shale. Trace Shale; brown black, dolomitic, bituminous. Trace Calcite and Pyrite.
8600 - 8610	Dolomite, as above, micro to very fine crystalline. Common Calcite vein in-filling. Trace light green, waxy Shale and Pyrite.
8610 - 8620	Dolomite; medium to dark gray brown, argillaceous, siliceous, crypto to microcrystalline, dense. Common Calcite vein in-filling.
8620 - 8630	Dolomite, as above, silty in part. Trace Dolomite; white, siliceous, fine to medium crystalline, granular, tight. Trace Limestone; light gray, siliceous, silty in part, microcrystalline. Trace Siltstone; light gray, dolomitic. Common Calcite vein in-filling.

Interval	Description
8630 - 8640	Dolomite; medium to dark gray brown, argillaceous, siliceous, crypto to microcrystalline, dense. Abundant Calcite (more than 50%) Common white chalky Limestone. Trace Pyrite.
8640 - 8690	Limestone; white, chalky and very light gray tan, lithographic. Abundant Calcite. Trace Pyrite.
8690 - 8700	Limestone, as above, becomes earthy in part. Common Dolomite; very light gray, siliceous, crypto to micro crystalline, very dense, very hard. Common Calcite. Trace Shale; very dark gray to black, dolomitic, micromicaceous, bituminous. Trace Pyrite.
8700 - 8720	Dolomite, as above, light gray to light gray tan. Abundant finely disseminated pyrite. Trace Dolomite; brown black, bituminous, argillaceous. Common Siltstone; white, dolomitic. Common Calcite.
8720 - 8730	Dolomite; light gray, siliceous, calcareous, crypto to micro crystalline, becomes earthy to microgranular in part, tight. Limestone; gray white to light gray tan, dolomitic, siliceous, crypto to microcrystalline, dense. Common white chalky Limestone becomes earthy to microgranular in part. Common Calcite and Pyrite.
8730 - 8740	Limestone; white, chalky and light tan, cryptocrystalline, dense. Common white earthy to microgranular Limestone. Common Calcite and Pyrite.
8740 - 8750	Limestone, as above. Common Limestone; white and brown mottled, very fine to medium fragmental, chalky. Trace light gray green waxy Shale. Trace Pyrite. Common Calcite.
8750 - 8760	Limestone; white, chalky and light gray tan, litho to cryptocrystalline. Abundant Calcite. Trace finely disseminated Pyrite, as above.
8760 - 8790	Limestone; medium gray tan, lithographic and minor white chalky. Common Calcite. Trace Pyrite. Trace Shale; light gray green, calcareous, waxy.
8790 - 8800	Limestone, as above. Common Calcite. Trace Shale, as above. Common Pyrite; finely disseminated and vein in-filling.

Interval	Description
8800 - 8820	Limestone, as above. Trace Shale; brown black, bituminous, silty, slightly micromicaceous. Common finely disseminated Pyrite. Trace chunky Pyrite. Trace Limestone; white and brown mottled, micro to medium fragmental, chalky.
8820 - 8850	Limestone, as above.Trace fragmental Limestone, as above. Trace Shale; light gray green, calcareous, waxy. Common Pyrite.
8850 - 8860	Limestone, as above. Dolomite; very light gray to light gray tan, crypto to medium crystalline, dense. Common finely disseminated Pyrite. Trace Calcite.
8860 - 8880	Dolomite, as above, crypto to medium crystalline, dense. Common Pyrite. Trace Calcite. Trace Bitumen. Trace Dolomite; medium to dark gray brown, argillaceous, bituminous, micro-crystalline, tight.
8880 - 8890	Dolomite, as above. Limestone; medium gray tan, dolomitic, cryptocrystalline, dense. Common white chalky Limestone. Common Calcite. Trace Shale; brown black, bituminous, slightly micromicaceous, chunky to blocky and splintery.
8890 - 8900	Dolomite, as above, micro to medium crystalline. Common Limestone; white, chalky to earthy. Common black bituminous Shale, as above.
8900 - 8940	Dolomite; light gray tan, micro to fine crystalline, dense. Common Limestone; medium gray tan, dolomitic, cryptocrystal-line, dense. Common black Shale, as above. Common finely disseminated Pyrite. Trace Pyrobitumen. Trace white chalky to earthy Limestone. Common Calcite.
8940 - 8960	Dolomite; light gray tan, crypto to microcrystalline, dense, with common Calcite in-filled small vugs. Tight. Common Calcite vug in-filling. Common finely disseminated Pyrite. Trace pyrobitumen staining. Trace white chalky to earthy Dolomite.
8960 - 8980	Dolomite, as above, micro to medium crystalline, tight. Trace white chalky to earthy, calcareous Dolomite. Trace Pyrite. Common Calcite vug in-filling.
8980 - 9000	Dolomite, as above, light gray to cream. Common Calcite. Trace Pyrobitumen.

Interval	Description
9000 - 9030	Dolomite; light gray tan, micro to very fine crystalline, tight. Common Dolomite; white, chalky to earthy. Common Calcite vein in-filling.
9030 - 9050	Dolomite; light gray tan, as above. Trace finely disseminated Pyrite. Trace Calcite.
9050 - 9060	Dolomite, as above. Common Calcite vein in-filling. Common Pyrite. Trace Shale; black silty, dolomitic.
9060 - 9080	Dolomite, as above. Common Dolomite; white, chalky to earthy with occasional pin-point vugs. Common Calcite. Trace black Shale, as above.
9080 - 9090	Dolomite, as above. Abundant white chalky to earthy Dolomite. Common Shale; brown black, dolomitic, silty, micromicaceous. Common Calcite vein in-fillings.
9090 - 9140	Dolomite, as above with occasional fine vugs, generally isolated. No permeability. Common white chalky Dolomite. Trace Shale; as above, very dark brown gray to brown black. Trace Shale; light to medium gray green, waxy, slickensided. Common Calcite.
9140 - 9160	Dolomite, as above, micro to fine crystalline. Occasional pin-point to coarse vugs. No staining or fluorescence. Common Calcite.
9160 - 9210	Dolomite, as above, dense. Common Calcite. Trace white, coarse crystalline Dolomite clusters.
9210 - 9220	Dolomite, as above. Abundant Dolomite; white to light gray tan, chalky to earthy, very friable, tight.
9220 - 9240	Dolomite; light tan, very fine to medium crystalline, tight. Common white chalky to earthy Dolomite. Trace Calcite.
9240 - 9260	Dolomite; light gray tan, micro to coarse crystalline with occasional micro to fine vugs. Common Calcite and white, very coarse crystalline Dolomite vug or fracture in-fillings. No stain, fluorescence or cut. Note: Drilled very rough.
9260 - 9280	Dolomite as above. Abundant Calcite in-filling. Trace coarse isolated vugs.
9280 - 9300	Dolomite, as above, cream to very light tan (Calcite > 50%) Common Calcite; white, earthy to microgranular, tight. Trace white chalky Limestone (altered Calcite)
9300 - 9310	Dolomite,as above. Abundant Calcite. Common Limestone; white, chalky and earthy to microgranular, dolomitic, tight.

Interval	Description
9310 - 9320	Dolomite, as above. Abundant Calcite. Common white, coarse, crystalline Dolomite vug lining. Possible vuggy porosity. No stain, fluorescence or cut.
9320 - 9330	Dolomite, as above with abundant white coarse crystalline dolomite vug lining with fair intercrystalline porosity. Probably good vuggy porosity. No staining or fluorescence. Common Calcite.
9330 - 9340	Dolomite; cream to very light tan, fine to medium crystalline. Common Dolomite; white, coarse crystalline (vug lining or infilling). Abundant Calcite. Common Limestone; gray white, dolomitic, micro to coarse fragmental, chalky to earthy.
9340 - 9350	Dolomite, as above, medium to coarse crystalline with occasional micro to fine isolated vugs. Abundant white, coarse crystalline Dolomite, as above. Common Calcite. Common Limestone, as above, micro to fine fragmental.
9350 - 9360	Dolomite; cream to very light tan, fine to medium crystalline, tight. Common white, coarse crystalline Dolomite, as above. Common Calcite. Trace Dolomite; light gray, argillaceous, crypto to microcrystalline, dense and very dark brown gray to brown black, argillaceous, siliceous, microcrystalline, dense, hard.
9360 - 9390	Dolomite; cream to very light tan, as above. Common white, coarse crystalline Dolomite and Calcite as above. Occasional very fine to medium, isolated vugs.
9390 - 9410	Dolomite; very light gray tan, micro to medium crystalline, tight. Rare very fine to medium isolated vugs. Abundant white, coarse crystalline Dolomite. Common Calcite.
9410 - 9430	Dolomite, as above. Common Shale; brown black, dolomitic, silty, micromicaceous, chunky.
9430 - 9450	Dolomite, as above. Abundant white, coarse crystalline Dolomite, as above. Trace Calcite. Trace Dolomite; light green gray, argillaceous, siliceous, microcrystalline, dense.
9450 - 9470	Dolomite, as above, becomes chalky to earthy in part. Abundant white, coarse crystalline Dolomite. Occasional very fine to fine isolated vugs.
9470 - 9480	Dolomite, as above. Trace Common white, coarse crystalline, Dolomite. Common Dolomite; light green gray, argillaceous, siliceous, microcrystalline, dense. Trace Pyrite.

Interval	Description
9480 - 9490	Dolomite; cream to very light tan, calcareous, micro to medium crystalline, tight. Abundant white, coarse crystalline Dolomite. Common Calcite. Trace white Limestone; dolomitic, chunky to earthy. Common Dolomite; light to medium greenish gray, siliceous, argillaceous, microcrystalline, dense.
9490 - 9500	Dolomite, as above. Common Shale; brown black, dolomitic, silty, micromicaceous, chunky.
9500 - 9520	Dolomite, as above.
9520 - 9560	Dolomite, as above; light tan. Common Dolomite; light greenish to olive gray, argillaceous, siliceous, crypto to microcrystalline, dense, very hard. Common Calcite.
9560 - 9590	Dolomite; light buff, fine crystalline, tight. Abundant white, coarse crystalline Dolomite in-filling. Common Calcite. Common argillaceous, siliceous Dolomite, as above.
9590 - 9610	Dolomite; buff to light brown, micro to fine crystalline, argillaceous in part, dense. Common Dolomite; medium to dark green gray, argillaceous, siliceous, crypto to microcrystalline, dense. Trace white, coarse crystalline Dolomite. Common Calcite.
9610 - 9620	Dolomite; as above, brown. Common Calcite. Trace Pyrite.
9620 - 9630	Dolomite; buff to brown, siliceous, micro to fine crystalline with occasional coarse isolated vugs. Common white, coarse crystalline Dolomite. Common Calcite. Common Dolomite; light to dark green gray, siliceous, argillaceous, crypto to micro crystalline, dense, very hard. Trace Dolomite; black, argillaceous, siliceous, bituminous, dense.
9630 - 9650	Dolomite as above and Dolomite; black, argillaceous, bituminous, siliceous, microcrystalline, dense, very hard, platy. Trace Shale; black, dolomitic, silty, bituminous.
9650 - 9660	No Sample. Tripping.
9660 - 9670	Dolomite; white to very light gray brown, very fine to medium crystalline, dense and black, argillaceous, bituminous, siliceous, microcrystalline, tight, commonly platy. Common Shale; black, dolomitic, bituminous, chunky. Common Limestone; white and light to dark gray brown mottled, argillaceous and bituminous in part, fine to medium fragmental, chalky to microcrrystalline, tight.

Interval	Description
9670 - 9680	Dolomite, as above. Common Shale, as above.
9680 - 9690	Dolomite, as above. Limestone, as above, dolomitic. Common Shale, as above.
9690 - 9710	Limestone, as above. Common Dolomite, as above. Common Shale, as above. Fossil Brachiopods.
9710 - 9730	Limestone, as above. Common black Shale, as above. Trace black Dolomite, as above.
9730 - 9740	Limestone, as above. Common black Dolomite and Shale, as above.
9740 - 9750	Limestone; white and light to dark gray brown, mottled, dolomitic and bituminous in part, very fine to medium fragmental, chalky to earthy, tight.
9750 - 9770	Limestone, as above. Trace Dolomite; very dark brown gray to black, bituminous, argillaceous, microcrystalline, tight. Trace Shale; black, dolomitic, bituminous, slickensided in part.
9770 - 9780	Limestone, as above. Common Dolomite, as above. Common Dolomite; white to very light gray brown, fine to medium crystalline with patchy very poor intercrystalline porosity. Pores in-filled or lined with pyrobitumen.
9780 - 9810	Limestone; light to dark gray brown, mottled, argillaceous, dolomitic, very fine to medium fragmental, chalky to earthy. Common Limestone; very light gray brown, dolomitic, fine to medium crystalline, tight. Trace black Dolomite and Shale, as above.
9810 - 9820	Limestone, as above. Dolomite; very dark gray brown to brown black, calcareous, bituminous, argillaceous, microcrystalline, tight. Trace Shale; black, dolomitic, bituminous, hard.
9820 - 9850	Dolomite, as above, slightly cherty. Limestone, as above. Common Limestone; very dark gray tan to black, argillaceous, siliceous, cryptocrystalline. Trace Chert; black, argillaceous, subvitreous. Trace black Shale, as above. Trace Shale; very dark gray brown, dolomitic, micromicaceous, chunky.
9850 - 9880	Dolomite, as above, very cherty. Abundant Chert; brown black, argillaceous and dolomitic in part,

Interval	Description
9850 - 9880	(cont'd.) vitreous. Common Limestone; light to medium gray brown, dolomitic, bituminous, microfragmental, earthy to microcrystalline. Common Shale; black, dolomitic, bituminous, common siliceous, hard, brittle. Trace white Calcite vein in-filling.
9880 - 9900	Dolomite, as above, very cherty. Limestone; very light to dark gray brown, mottled, bituminous, argillaceous, micro to fine fragmental, earthy to chalky, and microcrystalline, tight. Abundant Chert, as above. Common Shale, as above. Common Calcite vein in-filling.
9900 - 9910	Dolomite, Chert and Shale, as above. Common Limestone, as above. Common Calcite vein in-filling. Trace white coarse, crystalline Dolomite in-filling.
9910 - 9940	Limestone, as above, micromicaceous in part. Common Dolomite, Chert and Shale, as above. Trace Calcite and white, coarse crystalline Dolomite.
9940 - 9960	Limestone; medium to dark gray brown, argillaceous, bituminous, microcrystalline, tight. Common Dolomite, Shale and Chert, as above. Trace Calcite and white Dolomite.
9960 - 9970	Limestone, as above, very argillaceous. Shale; black, bituminous, calcareous, slightly micromicaceous. Common black Dolomite and Chert, as above.
9970 - 9980	Limestone; light and dark gray brown mottled, argillaceous, bituminous, micro to fine fragmental, chalky to earthy. Common Shale, as above. Common Limestone; black, bituminous, argillaceous, microcrystalline. Trace black Chert, as above.
9980 - 10,000	Limestone; very dark brown gray to brown black, very argillaceous, bituminous, microcrystalline, tight. Common fragmental Limestone, as above. Common Shale, as above. Trace black Chert, as above. Trace Calcite vein in-filling.
10,000 - 10,030	Limestone; light to dark gray brown and brown black, very argillaceous, micromicaceous, bituminous, marly, micro to fine fragmental, microcrystalline to chalky. Common Shale; black bituminous, silty, micromicaceous.
10,030 - 10,040	Limestone; brown black, argillaceous, bituminous, micromicaceous, microcrystalline. Limestone; light gray brown, micromicaceous, micro to fine fragmental, chalky to microcrystalline. Common Dolomite; white to very light tan, medium to coarse crystalline. Rare fine to medium isolated vugs. Common Shale, as above.

Interval	Description
10,040 - 10,050	Limestone; very light gray brown, marly, micro to fine fragmental, chalky to earthy, very soft. Abundant black Shale, as above.
10,050 - 10,070	Limestone, as above, bituminous, cherty. Common Limestone; brown black, bituminous, argillaceous, microcrystalline. Common black Shale, as above. Common Chert; black, vitreous. Common Calcite, vein in-filling.
10,070 - 10,080	Limestone; tan, cryptocrystalline and white chalky. Common black Limestone and Shale, as above. Common Calcite.
10,080 - 10,100	Limestone, as above, and light gray brown, marly, bituminous, cherty, micro to medium fragmental, chalky to earthy. Common black Limestone and Chert, as above. Common Calcite vein in-filling.
10,100 - 10,130	Limestone; medium to dark gray brown and black, bituminous, argillaceous, cherty, microcrystalline. Common Limestone, as above. Abundant Chert; dark gray tan to black, subvitreous. Common Calcite vein in-filling.
10,130 - 10,140	Limestone; light to dark gray brown mottled, argillaceous, bituminous, very fine to coarse fragmental, chalky to microcrystalline, tight. Common Limestone; brown black, argillaceous, bituminous, siliceous in part, microcrystalline, dense. Trace Shale; black, dolomitic, bituminous, hard, chunky. Trace Chert; black, vitreous. Trace Limestone; dark gray tan, argillaceous, cryptocrystalline to lithographic.
10,140 - 10,160	Fragmental Limestone, as above and dark gray tan lithographic Limestone, as above, probably brecciated. Common Calcite vein in-filling. Trace black Shale, as above. Common black, bituminous argillaceous Limestone, as above.
10,160 - 10,170	Shale; black, shiny, micromicaceous in part, bituminous, slickensided in part. Limestone; very dark gray tan, argillaceous, lithographic, and gray white, chalky, commonly intermixed, brecciated. Trace Calcite.
10,170 - 10,190	Shale; very dark brown gray to brown black, micromicaceous, silty in part, blocky to chunky. Limestone, as above. Common Limestone; very light to dark gray brown and brown black, bituminous, microcrystalline, tight.

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10,190 - 10,210	Limestone; very dark gray tan, argillaceous, lithographic, platy, commonly inter-mixed with very light gray chalky Limestone. Dolomite; light to medium gray brown, bituminous, microcrystalline, tight. Trace black Shale, as above. Trace Calcite.
10,210 - 10,220	Limestone and Dolomite, as above, bracciated. Common Calcite. Trace black Shale, as above.
10,220 - 10,230	Limestone, as above. Dolomite, as above, microgranular, friable with poor intergranular porosity. Pores mostly in-filled with bitumen. No apparent permeability. Abundant gray white chalky Limestone. Common Calcite.
10,230 - 10,250	Limestone; medium to very dark gray tan, argillaceous, siliceous in part, litho to cryptocrystalline, very hard, brittle, platy. Abundant Limestone; very light gray brown, chalky.
10,250 - 10,260	Limestone; dark gray tan, cryptocrystalline, dense, and gray white to very light gray brown, chalky, soft. Common Shale; gray to brown black, calcareous, silty, micromicaceous. Common Calcite vein in-filling.
10,260 - 10, 270	Limestone, as above. Common Limestone; very light buff, dolomitic, very fine to fine crystalline. Trace black Shale, as above.
10,270 - 10,280	Limestone, as above. Common buff, dolomitic Limestone, as above. Common Limestone; dark gray brown to black, argillaceous, bituminous, microcrystalline. Trace black Shale.
10,280 - 10,300	Limestone; white and dark gray tan, mottled, fine fragmental, chalky to microcrystalline, tight. Limestone; medium to dark gray tan, lithographic to cryptocrystalline, platy, tight. Common Calcite vein and fracture in-fillings.
10,300 - 10,320	Limestone; dark gray tan, lithographic, platy. Common Limestone; gray white, chalky, fine fragmental in part. Common CAlcite vein and fracture in-fillings. Fossil gastropods.
10,320 - 10,330	Limestone; white and gray tan, micro to fine fragmental, chalky, tight. Common dark gray tan, lithographic Limestone, as above. Common Calcite.
10,330 - 10,350	Limestone, as above. Dolomite; very light gray tan to light brown, fine crystalline, tight. Common Calcite in-filling.

Interval	Description
10,350 - 10,360	Limestone, as above. Trace Dolomite, as above. Trace Calcite.
10,360 - 10,370	Limestone; medium to dark gray tan, lithographic, platy, brittle. Limestone; gray white and light to dark gray tan mottled, fine to medium fragmental, chalky. Trace Dolomite; as above, fine to medium crystalline. Rare micro vugs. No permeability. Common Calcite vein in-filling.
10,370 - 10,390	As above. Trace Shale; very dark brown gray, calcareous, silty, micromicaceous, chunky.
10,390 - 10,410	Limestone; dark gray tan, lithographic, hard, brittle, platy. Common white chalky Limestone. Common Calcite.
10,410 - 10,440	Limestone, as above. Common Dolomite; cream to light buff and light brown, fine crystalline, tight. Common gray white, chalky Limestone. Trace Calcite.
10,440 - 10,510	Limestone, as above. Common Limestone; gray white, chalky. Common Calcite vein and fracture in-filling.
10,510 - 10,540	Limestone, as above, styolitic. Trace Limestone; very dark gray brown, argillaceous, cryptocrystalline. Trace Dolomite; buff to brown, fine crystalline, tight. Common Calcite vein in-filling.
10,540 - 10,590	Limestone, as above. Common chalky Limestone, as above. Abundant Calcite vein in-filling.
10,590 - 10,600	Limestone, as above, styolitic. Abundant chalky Limestone. Common Dolomite; light buff, medium to coarse crystalline, tight. Common Calcite.
10,600 - 10,620	Dolomite, as above. Common Limestone, as above. Occasional micro to fine isolated vugs. No permeability.
10,620 - 10,640	Dolomite, as above, with patchy poor intercrystalline and micro to fine vug porosity. No apparent permeability. No stain, fluorescence or cut.
10,640 - 10,650	Dolomite, as above, fine to medium crystalline, with poor fine to medium vug porosity, very poor apparent permeability. No stain, fluorescence or cut. Trace Calcite in-filling.
10,650 - 10,700	Dolomite, as above, tight. Occasional fine, isolated vugs. Trace CAlcite. Occasional white, coarse Dolomite crystals.

Interval	Description
10,700 - 10,710	Dolomite; light buff, calcareous in part, fine to medium crystalline, common isolated very fine to coarse vugs. No permeability. No stain, fluorescence or cut. Common Limestone; very light tan, cryptocrystalline, dense, brittle. Common white, chalky Limestone. Common Calcite.
10,710 - 10,740	Limestone; light tan, cryptocrystalline to lithographic, as above. Common white chalky Limestone and Calcite. Common Dolomite, as above.
10,740 - 10,770	Limestone; light tan, lithographic, platy, dense, brittle. Common white, chalky Limestone. Trace Calcite.
10,770 - 10,790	Limestone, as above. Common white chalky Limestone. Common Calcite vein in-filling.
10,790 - 10,800	Limestone, as above. Abundant white chalky to earthy Limestone. Common Calcite vein in-filling.
10,800 - 10,810	Limestone, as above. Abundant white chalky to earthy Limestone. Trace Shale; very dark gray brown, silty, slightly micromiceous, chunky. Trace Shale; light gray green, waxy. Trace Dolomite; dark brown microcrystalline. Trace Chert; jet black, sub-vitreous. Common Calcite.
10,810 - 10,850	Limestone; light tan, lithographic to cryptocrystalline and white chalky to earthy. Trace Shale; light olive green, calcareous, waxy. Trace dark gray brown Shale, as above. Abundant Calcite vein in-filling.
10,850 - 10,860	Dolomite; white to light buff, medium to coarse crystalline with patchy, fair intercrystalline porosity and occasional micro to very fine vugs. No stain, fluorescence or cut. Traces of black residue in crystal interstices.
10,860 - 10,870	Dolomite, as above and buff to brown, fine to medium crystalline with poor medium to coarse vug porosity. Common white, coarse crystalline Dolomite with good intercrystalline porosity. No stain, fluorescence or cut. Traces of black residue in pores. Note: Chloride content of mud filtrate went from 400 ppm to 1200 ppm.
10,870 - 10,880	Dolomite; medium to dark brown, medium to coarse crystalline with patchy poor to fair intercrystalline and fine to medium vug porosity. No stain, fluorescence or cut. Common white, medium to coarse crystalline Dolomite with good intercrystalline porosity. Traces of black residue in crystal interstices. Common Limestone; light tan, cryptocrystalline, platy and white chalky.

Interval	Description
10,880 - 10,890	Dolomite, as above. Limestone; white and dark tan mottled, dolomitic, fine to medium fragmental, chalky. Common white, coarse crystalline Dolomite, as above.
10,890 - 10,900	Limestone, as above. Common white chalky Limestone. Common Dolomite, as above, with patchy fine intercrystalline and fine to medium vug porosity. No stain, fluorescence or cut.
10,900 - 10,910	Limestone; white and dark gray brown, fine to medium, pelletal, crypto to microcrystalline, tight. Common white, chalky Limestone. Trace Calcite in-filling. Trace Dolomite; white, fine to medium crystalline, with fair medium vug porosity. No staining. Trace pyrobitumen residue.
10,910 - 10,930	Limestone; fine to medium pelletal as above with a chalky to earthy matrix. Common Dolomite; white and light to medium brown, fine to medium crystalline with occasional fine to medium open vugs. No staining. Trace pyrobitumen.
10,930 - 10,950	Limestone, as above. Dolomite, as above (cavings)
10,950 - 10,960	Limestone, as above. Dolomite; white and light medium brown, fine to medium crystalline, tight. Shale; black, dolomitic, bituminous, micromicaceous.
10,960 - 10,980	Dolomite; light brown, fine to medium crystalline, tight. Common DOlomite; white, fine to medium crystalline (vug in-filling). Trace black Shale, as above.
10,980 - 11,020	Dolomite, as above with poor micro to very fine vug porosity. Common white Dolomite in-filling. Limestone; white to very light tan, dolomitic, fine to medium crystalline, tight. Common Limestone; light tan, cryptocrystalline. Common Calcite.
11,028 - 11,040	Dolomite and Limestone, as above. Common Limestone; white, chalky to earthy. Trace Shale; very dark gray brown to black, silty, micromicaceous.
11,040 - 11060	Dolomite, as above,calcareous, tight. Occasional isolated micro to fine vugs. No permeability. Common Dolomite, as above, medium to dark brown. Common white, medium crystalline Dolomite vug infilling.

Interval	DEscription
11,060 - 11,070	Dolomite; very light to medium brown, fine to medium crystalline, tight. Common white, medium crystalline dolomite vug in-filling, as above. Trace pyrobitumen in-filling.
11,070 - 11,090	Dolomite, as above, micro to fine crystalline. Common Dolomite; very dark gray brown, bituminous, microcrystalline, tight.
11,090 - 11,100	Dolomite; white to very light gray tan, micro to very fine crystalline and white, earthy, tight. DOlomite; very dark gray brown, bituminous, microcrystalline, tight.
11,100 - 11,190	Dolomite; light gray tan, microto very fine crystalline, tight. Common white, medium crystalline dolomite vein and vug in-filling. Trace white, earthy Dolomite.
11,190 - 11,200	Dolomite, as above. Trace white Dolomite infilling, as above.
11,200 - 11,220	Dolomite; light to medium brown, very crystalline, tight.
11,220 - 11,270	Dolomite, as above and medium to dark gray brown, bituminous in part, very fine to fine crystalline, tight. Trace white, medium crystalline Dolomite in-filling.
11,270 - 11,290	Dolomite; light tan to light brown, micro to very fine crystalline, tight. Common white, medium to coarse crystalline Dolomite vein or vug in-filling.
11,290 - 11,590	Dolomite; light brown, very fine to fine crystalline and medium to dark gray brown, shiny, bituminous in part, fine crystalline, sucrose in part, rare intercrystalline porosity, trace pyrobitumen in-filling. Common white, medium crystalline Dolomite vein in-filling.
11,590 - 11,650	Dolomite; medium gray brown, microcrystalline with irregular very fine crystalline patches.
11,650 - 11,680	Dolomite, as above.
11,680 - 11,700	DOlomite; light to medium gray brown, very fine to fine crystalline. Trace white Dolomite vein in-filling.
11,700 - 11,720	Dolomite, as above. Common Dolomite, as above, dark gray brown with common pyrobitumen in-filling.
11,720 - 11,730	Dolomite; medium to dark gray brown, fine to medium crystalline, tight. Common white Dolomite vein in-filling. Common pyrobitumen staining.

Interval	Description
11,730 - 11,740	Dolomite; white and light to medium gray brown, calcareous, fine to medium crystalline, friable, tight. Common white chalky Limestone. Common white Dolomite vein in-filling.
11,740 - 11,770	Dolomite; light to medium gray brown, fine to medium crystalline. Common white Dolomite vein in-filling.
11,770 - 11,940	Dolomite; white and light gray brown, fine to medium crystalline, dense. COMMON Dolomite; white, fine to medium crystalline with traces pinpoint vug porosity.
11,940 - 11,960	Dolomite; white as above and medium to dark gray brown, very fine to fine crystalline, irregular medium crystalline patches, no apparent porosity, rare Dolomite veins; with Dolomite; light brown, fine crystalline, rare vug porosity, no stain.
11,960 - 12,000	Dolomite; white, fine to medium crystalline, tight. Trace Dolomite; dark gray brown, fine to medium crystalline, tight. TRace Limestone; light gray microcrystalline, dense, chalky in part. Trace finely disseminated Pyrite.
12,000 - 12,010	Dolomite, as above, white to light gray tan, tight. LImestone; white to very light gray tan, cryptocrystalline and white chalky. Trace Calcite. Abundant white, coarse, crystalline Dolomite.
12010 - 12,040	LIMEstone, as above. Common white Dolomite, as above. Trace Dolomite; medium to dark gray brown, fine crystalline, tight.
12,040 - 12,060	Limestone; light to medium gray tan, cryptocrystalline and white, chalky to earthy.
12,060 - 12,110	Limestone, as above. Common Dolomite; white to very light gray tan, fine to medium crystalline, tight.
12,110 - 12,180	Limestone; light tan, cryptocrystalline. Common white chalky Limestone. Trace Dolomite, as above. Trace Dolomite; dark gray brown, bituminous, micro to fine crystalline, tight. Trace Shale; light green gray, waxy. Common CAlcite vein in-filling.
12,180 - 12,360	Limestone; light tan, cryptocrystalline, as above. Common white chalky Limestone. Common Calcite. Trace Shale, as above.
12,360 - 12,380	Limestone; light tan, cryptocrystalline. Common Limestone; white, chalky to earthy, becomes white and tan mottled, fine fragmental, chalky in part. Trace Dolomite;

Interval	Description
12,360 - 12,380	(Cont'd.) medium gray brown, micro to fine crystalline, tight. Trace Shale; brown black, bituminous. Common Calcite in-filling.
12,380 - 12,440	Limestone, as above. Common white chalky LImestone. Trace Calcite.
12,440 - 12,450	Limestone, as above, stylolitic. Trace pyrobitumen staining. Trace Shale; black, bituminous. Rare Shale; light green gray, waxy.
12,450 - 12,470	Limestone, as above. Abundant white chalky Limestone becomes earthy in part. Common Dolomite; medium gray brown, fine crystalline, dense. Common Shale; brown black, silty, dolomitic, chunky (Cavings) Trace Shale; light green gray, waxy, slickensided. Common white, coarse crystalline Dolomite vein in-filling. Trace Pyrite.
12,470 - 12,480	Limestone; white to cream and light tan, cryptocrystalline, dense. Common gray brown Dolomite, as above. Common white, coarse crystalline Dolomite in-filling. Trace Dolomite; very dark gray brown to black, bituminous, microcrystalline. Common black Shale, as above.
12,480 - 12,490	Limestone; light tan, cryptocrystalline and white chalky. Common brown Dolomite, as above, sandy in part. Common white coarse crystalline Dolomite in-filling. Trace black bituminous Dolomite. Trace Calcite. Trace Shale; light to dark green gray, pyritic, waxy. Trace Pyrite.
12,490 - 12,500	Limestone; light tan, cryptocrystalline, as above. Common white chalky Limestone. Abundant Calcite. Common Dolomite; white, coarse crystalline. Common Dolomite; medium to dark brown, siliceous, fine to medium crystalline, dense. Trace black dolomitic Shale, as above. Trace light gray green waxy Shale.
12,500 - 12,520	Dolomite; white to very light gray tan, fine to medium crystalline with patches of coarse crystalline, tight. Trace pyrobitumen staining in crystal interfaces. Common brown Dolomite, as above. Common tan Limestone, as above. COmmon Calcite.
12,520 - 12530	Dolomite; white, medium to coarse crystalline, tight, and dark brown, micro to fine crystalline, tight. Trace white, chalky Limestone. Trace Shale; brown black, dolomitic, chunky. Trace light green gray, waxy, pyritic Shale.

Interval	Description
12,530 - 12,540	Dolomite; medium to dark gray brown, very fine to fine crystalline, dense. Common Dolomite; white, medium to coarse crystalline, tight. Trace Shale; very dark gray brown, silty, bituminous, micromicaceous.
12,540 - 12,550	Dolomite, as above, light to medium gray brown. Trace Dolomite; light brown micro to sucrosic with fine intergranular porosity. Common white Dolomite vein in-filling. Trace Pyrobitumen in-filling.
12,550 - 12,580	Dolomite; light to medium gray brown, very fine to fine crystalline, tight. Common white, coarse crystalline Dolomite in-filling. Trace Pyrobitumen.
12,580 - 12,660	Dolomite, as above, calcareous. Common very light brown, chalky, calcareous Dolomite. Common white Dolomite in-filling.
12,660 - 12,710	Dolomite, as above, cherty. Common Dolomite; dark gray brown, siliceous, cherty, bituminous, fine crystalline. Abundant Chert; medium to dark gray tan, vitreous. Trace Shale; very dark brown gray, dolomitic, silty, micromicaceous.
12,710 - 12,740	Dolomite; dark gray brown, bituminous, siliceous, fine crystalline, tight. Trace Shale; black, bituminous.
12,740 - 12,760	Dolomite; medium gray brown, fine to medium crystalline, tight. Trace pyrobitumen staining. Dolomite; white to cream an very light tan, medium to coarse crystalline, tight.
12,760 - 12780	Dolomite; white to cream, medium to coarse crystalline, tight. Common brown Dolomite, as above.
12,780 - 12,840	Dolomite; white to cream, as above. Trace dark gray brown Dolomite partings, as above. Trace fractures or styolites lined with Pyrobitumen. Trace medium to coarse isolated vugs at 12,820 to 12,830.
12,840 - 12,860	Dolomite; white to cream as above. Trace fractures or styolites lined with Pyrobitumen.
12,860 - 12,890	Dolomite, as above, siliceous. Common Dolomite; white and very dark gray tan mottled, siliceous, slightly cherty, very fine to fine crystalline, dense. Trace Chert; very dark gray tan, vitreous.
12,890 - 12,900	Dolomite, as above. Trace black shiny Chert.

Interval	DEscription
12,900 - 12930	Dolomite; white to cream, medium to coarse crystalline, tight. Trace Dolomite; white and gray brown, siliceous, slightly cherty, very fine to medium crystalline. Trace Shale; brown black, dolomitic, silty and black, bituminous.
12,930 - 12,940	Dolomite, as above. Trace Dolomite; light brown, sandy, very fine crystalline and dark gray brown, silty, argillaceous, microcrystalline. Trace black Shale as above (Cavings?)
12,140 - 12,950	Dolomite, as above. Common Dolomite; light to medium gray brown, micro to fine crystalline. Trace silty and sandy Dolomite, as above (Cavings)
12,950 - 12,960	Dolomite, as above, fine to medium crystalline. TRace white, coarse, crystalline Dolomite cluster (vug lining or vein in-filling). Trace isolated fine vugs. No apparent effective porosity. COommon Limestone; very light tan, microcrystalline, dense. Trace Shale; very dark gray brown, dolomitic, silty, micro-micaceous (Cavings)
12,960 - 12,970	Dolomite; white, medium to coarse crystalline, tight. Trace Dolomite; light to medium gray brown, very fine to fine crystalline. Trace Shale, as above.
12,970 - 13,030	Dolomite, as above, fine to medium crystalline. Trace Lime-stone; very light tan, crypto to microcrystalline, dense. Trace brown Dolomite, as above (vein in-filling). Trace fine isolated vugs. No effective porosity.
13,030 - 13,060	Dolomite, as above. Trace white, chalky to earthy Limestone.
13,060 - 13,070	Dolomite; white, medium to coarse crystalline, tight. Trace Limestone; very light tan, crypto to microcrystalline, dense. Trace white chalky Limestone.
13,070 - 13,100	Dolomite, as above. Trace brown, micro to fine crystalline dolomite infilling.
13,100 - 13,120	Dolomite, as above. Common Shale; very dark gray brown to black, silty, micro-micaceous (Cavings). Trace brown Dolomite, as above.
13,120 - 13,130	Dolomite, as above. Trace Dolomite; dark brown and black mottled, argillaceous, siliceous, microcrystalline, dense, very hard. Trace light to medium brown Dolomite, as above. Trace Pyrite. Common Shale, as above (Cavings)
13,130 - 13,140	Dolomite, as above. Trace Dolomite; light green gray, silty, siliceous, microcrystalline, dense, very hard. Trace brown Dolomite, as above. Trace Dolomite; light to medium gray brown, silty, sandy in part, microcrystalline. Trace Shale cavings, as above.

Interval	Description
13,140 - 13,150	Dolomite, as above.
13,150 - 13,160	Dolomite, as above. Abundant Cavings (Shale, as above, Sandstones and dark Limestones. Trace Limestone; brown black, argillaceous, siliceous, microcrystalline.
13,160 - 13,170	Dolomite, as above, fine to medium crystalline. Common Limestone; light tan, cryptocrystalline, dense and white chalky to earthy. Common Cavings, as above.
13,170 - 13,180	Dolomite, as above. Limestone; light tan, dolomitic, cryptocrystalline and white chalky to earthy. Common Dolomit; black, argillaceous, bituminous, siliceous, microcrystalline. Trace Dolomite; dark brown, silty, sandy in part, microcrystalline. Common Shale; black, bituminous and very dark gray brown, dolomitic, micromicaceous, silty. Trace Pyrite.
13,180 - 13,210	Dolomite, as above. Trace light brown, dolomitic in-filling. Trace Pyrite. Common Dolomite; white, calcareous, micro to fine fragmental, chalky, tight. Common Limestone; white, dolomitic, chalky to earthy.
13,210 - 13,230	Limestone; white, dolomitic, micro to very fine fragmental, chalky. Trace Limestone; light tan, cryptocrystalline. Common Dolomite, as above.
13,230 - 13,240	Limestone; white, chalky and light tan, cryptocrystalline. Common fragmental Limestone, as above. Trace Dolomite, as above.
13,240 - 13,270	Limestone; light tan, cryptocrystalline. Common white, chalky Limestone. Trace Limestone; dark gray brown, argillaceous, cryptocrystalline. Common Dolomite; white to cream and light gray tan, fine crystalline, dense. Trace Dolomite; medium to dark gray brown, very fine to fine crystalline, argillaceous in part.. Common Calcite. Abundant Cavings, mostly black bituminous Shale.
13,270 - 13,300	Limestone; light tan, cryptocrystalline and white chalky, stylolitic. Trace brown, argillaceous Dolomite, as above. Common black, bituminous Shale. Common Cavings. Trace Pyrite.
13,300 - 13,320	Limestone, as above, stylolitic. Trace brown Dolomite, as above. Common finely disseminated Pyrite, mostly on fracture faces. Common Calcite and black bituminous Shale. Few Cavings.

Interval	Description
13,320,-13,330	Limestone, as above, stylolitic, becomes fragmental, chalky in part. Trace brown Dolomite, as above. Trace Dolomite; brown black, bituminous, argillaceous, micro to very fine crystalline, very hard, dense.
13,330 - 13,380	Limestone, as above. Common Limestone; white and tan, fine fragmental, chalky. Trace Limestone; dark chocolate brown, argillaceous, cryptocrystalline. Trace Dolomite; brown, bituminous, fine crystalline. Trace Dolomite; dark chocolate brown, micro to ·y fine crystalline. Trace Chlorite at 13,350. Trace Calcite and Pyrite. Common Shale Cavings.
13,380 - 13,390	Limestone; white and medium to dark gray brown, dolomitic, fine to medium fragmental, cryptocrystalline to chalky, tight. Limestone; light tan, cryptocrystalline and white chalky. Dolomite; light tan and light to dark gray brown, micro to medium fragmental, cryptocrystalline. Dolomite; brown, fine crystalline, tight. Trace Pyrite. Common black, bituminous Shale (Cavings)
13,390 - 13,400	Dolomite; medium to dark brown, siliceous, cherty in part, bituminous, argillaceous, micro to medium fragmental, crypto to very fine crystalline, brecciated and intermixed with white and tan Limestone, as above, and light tan Dolomite, as above. Trace Pyrite. Common Shale; brown black, bituminous.
13,400 - 13,410	Dolomite; brown, siliceous, bituminous, very fine to fine crystalline and light tan to dark gray brown fragmental Dolomite, as above. Brecciated. Common Calcite and finely disseminated Pyrite.
13,410 - 13,420	Dolomite; brown, siliceous, bituminous, micro to fine fragmental, brecciated. Common Calcite. Trace Pyrite.
13,420 - 13,440	Dolomite, as above. Common Dolomite; very light gray to light tan, siliceous, cryptocrystalline.
13,440 - 13,460	Dolomite; very light gray to light tan, siliceous, crypto to microcrystalline, dense. Dolomite; brown, very fine to fine crystalline.
13,460 - 13,490	Dolomite; light tan, micro to fine fragmental. Common light gray and light tan Dolomite, as above.
13,490 - 13,500	Dolomite; white to very light tan, very fine to fine crystalline, tight. Common light gray and light tan Dolomite, as above. Trace Pyrite.

Interval	Description
13,500 - 13,520	Dolomite; white to very light tan, as above. Rare fine to medium vugs. Trace Pyrobitumen and Pyrite. Trace Dolomite; very light gray, slightly argillaceous, microcrystalline, dense. Trace light brown, fine crystalline Dolomite.
13,520 - 13,530	Dolomite; white to very light tan, very fine to fine crystalline, tight. Common Dolomite; light to medium green gray, argillaceous, pyritic, microcrystalline, dense. Common finely diseminated Pyrite. Trace light brown Dolomite, as above.
13,530 - 13,540	Dolomite; white to very light tan, fine to medium crystalline, tight. Trace Shale; very dark gray brown, dolomitic, micromicaceous, pyritic in part.
13,540 - 13,570	Dolomite, as above. Trace Pyrobitumen and light green gray Dolomite, as above.
13,570 - 13,600	Dolomite; cream to very light tan, fine to medium crystalline, occasional pinpoint vugs. Common clusters of white, medium to coarse crystalline, dolomite vug or fracture lining. Trace Dolomite; light green gray to gray brown, slightly argillaceous, microcrystalline, dense, Trace Shale, as above.
13,600 - 13,620	Dolomite, as above. Rare pinpoint vugs. Common white, coarse crystalline dolomite in-fillings. Trace Calcite and Pyrobitumen.
13,620 - 13,640	Dolomite, as above, siliceous. Common white, coarse crystalline Dolomite. Trace Calcite. Trace white chalky Limestone and Pyrobitumen.
13,640 - 13660	Dolomite; very light tan, siliceous, micro to fine crystalline, dense. Trace white, coarse crystalline Dolomite.
13,660 - 13,700	Dolomite, as above, very fine to medium crystalline. Trace white, coarse crystalline Dolomite. Trace white chalky Limestone. Trace pinpoint vugs. Trace Pyrobitumen. Trace Shale; black, bitumnous (Cavings?). Trace Shale; very dark gray brown to brown black, slightly dolomitic, silty, micromicaceous (Cavings?)
13,700 - 13,710	Dolomite, as above and white to very light tan, micro to fine crystalline, chalky. Common white, medium to coarse Dolomite. Trace Dolomite; dark brown to brwwn black, argillaceous, bituminous, siliceous, microcrystalline. Trace Shale; brown black, silty, bituminous, micromicaceous. Trace Pyrite and Pyrobitumen.

Interval	Description
13,710 - 13,720	Dolomite; white to very light tan, very fine to medium crystalline. Occasional pinpoint vugs. Common white, coarse crystalline Dolomite, as above. Trace brown to black Dolomite, as above. Trace Shale, as above. Trace Pyrite.
13,720 - 13,750	Dolomite; white to light tan, siliceous, micro to fine crystalline. Common white, coarse crystalline Dolomite, vug lining or vein in-filling. Common brown to black, siliceous Dolomite, as above. Occasional very fine to medium isolated vugs. Common finely disseminated Pyrite. Trace Pyrobitumen and Shale, as above.
13,750 - 13,790	Dolomite; white to very light tan, siliceous, micro to very fine crystalline, dense. Common Dolomite; brown to black, siliceous, bituminous, microcrystalline. Common finely disseminated Pyrite. Trace Pyrobitumen.
13,790 - 13,820	Dolomite; white to cream, siliceous, micro to fine crystalline. Common white, fine to medium crystalline Dolomite vug or vein in-filling with traces fine intercrystalline porosity. Rare pinpoint vugs.
13,820 - 13,830	Dolomite; very light tan, very fine to fine crystalline, dense. Occasional isolated pinpoint vugs.
13,830 - 13840	Dolomite; white to cream, micro to very fine crystalline with poor fine to coarse vug porosity. No stain, fluorescence or cut. Common white to cream, medium crystalline Dolomite clusters - vug lining.
13,840 - 13,850	Dolomite, as above, dense.
13,850 - 13,870	Dolomite; light tan, siliceous, micro to very fine crystalline with common very fine to medium vugs mostly isolated. Trace white to light tan, microcrystalline cluster Dolomite. Trace Dolomite; dark gray brown to brown black, bituminous, argillaceous, micro to very fine crystalline, dense. Trace Shale; brown black, bituminous, styolitic, micromicaceous.
13,870 - 13,900	Dolomite; light tan, very fine to medium crystalline,. Rare isolated vugs, as above. Common white to light tan, medium to coarse crystalline Dolomite clusters.
13,900 - 13,930	Dolomite, as above. Trace Dolomite; medium to dark gray brown and brown black, bituminous, microcrystalline, dense.

Interval	Description
13,930 -13,950	Dolomite; dark gray brown to brown black, argillaceous, bituminous, microcrystalline, dense. Dolomite; light tan, as above. Trace black Shale, as above.
13,950 - 13,970	Dolomite; dark gray brown to brown black, argillaceous, bituminous, micro to very fine crystalline and light to medium tan, fine to medium crystalline, dense. Common white, medium to coarse crystalline Dolomite vein in-filling.
13,970 - 14,000	Dolomite; light tan, very fine to fine, crystalline. Common isolated pinpoint vugs. Common white, chalky Dolomite. Common brown black Dolomite, as above. Common white, coarse crystalline Dolomite vein in-filling. Trace Calcite and Pyrite.
14,000 - 14,037	Dolomite Breccia; composed of white, coarse crystalline Dolomite; light tan to light brown, very fine to medium crystalline Dolomite and dark gray brown to brown black, argillaceous, bituminous, microcrystalline Dolomite. Rare isolated medium to coarse vugs. Trace Shale; brown black, slightly dolomitic, bituminous.
14,037 - 14,043	See Core Descriptions.

SECTION III

(a) REPORT OF DRILL STEM TESTS

D.S.T. #1: Interval 8050' - 8120' (Mid Devonian)

Misrun (Hit bridge at 5300'. Packer would not go down.)

D.S.T. #2: Interval 8220' - 8300' (Mid Devonian)
(800' water cushion)

Preflow 15', I.S.I. 60', V.O. 20', No F.S.I

Weak initial puff, dead in 7'. Weak air blow, dead in 5'.
Pulled packer loose after 20 min.
Recovered 1000' fluid; 800' water cushion, 200' mud.

I.H.P. 3788, I.S.I.P. 3589, I.F.P. plugged
F.H.P. 3810, F.S.I.P. - F.F.P. "

Temperature: 224°F. Recorder depth: 8202'

D.S.T. #3: Interval 10,845' - 10,970' (Ordovician)
(3040' water cushion)

Small air blow, dead in 10 min. Small airblow on initial flow, dead in 20 min.
Recovered 3590' fluid; 3040' water cushion, 100' muddy water, 450' slightly gas cut mud.
Misrun - unable to obtain flow period due to very crooked hole. The shut in and flow period stages were missed.
I.H.P. 5447, I.S.I.P. 3802, I.F.P. 2355 psi
F.H.P. 5119, F.S.I.P. 3915, F.F.P. -

Temperature: 190°F. Recorder #887

D.S.T. #4: Interval 10,845' - 10,970' (Ordovician)
(3040' water cushion)

V.O. 60', F.S.I. 90'

Weak airblow, steady throughout. No gas to surface.
Recovered 8055' fluid: 275' muddy fresh water, 3490' slightly gas cut water cushion, 2,560' slightly gas cut mud, 1,730' sulphurous watery mud.
I.H.P. 5249, I.S.I.P. Not run. I.F.P. 1559 psi
F.H.P. 5249, F.S.I.P. 4704, F.F.P. 4136 psi

Recorder depth: 10,838'. Temperature: 196°F
Note: Mud dropped 20' at beginning of test, filled up and kept full through test.

D.S.T. #5: Interval 9685' - 9930' (Silurian)

Misrun (Packers did not hold)

D.S.T. #6: Interval 3812' - 3824' (Cretaceous)
Preflow 15', I.SI. 60", V.O. 15', F.S.I. 30'
Weak initial puff. Very weak air blow, dead in 11'.
Recovered 2' drilling mud.
I.H.P. 1889, I.S.I.P. 15, I.F.P. 13 psi.
F.H.P. - F.S.I.P. 8, F.F.P. 13 psi.
Recorder depth: 3818'. Temperature: 100°F

SECTION III

(b) CASING RECORD

Conductor Pipe: Ran 90' of 20" x 94#, H-40 Conductor Pipe.
Cemented with 320 sacks Fondu Cement.
Plug down at 4:00 A.M., April 23.

Surface Casing: Ran 49 joints (1529.02') 13 3/8" x54.5#, ST&C,
K-55 casing. Landed at 1522' K.B.
Cemented with 1200 sacks Fondu Cement + 1% NaCl in 600 sacks.
Plug down at 2:00 P.M., May 2, with 200 psi.

SECTION III

(c) BIT RECORD

BIT#	SIZE	MAKE & TYPE	DEPTH OUT	FOOTAGE	HOURS RUN	DULL COND. T	B	G	Wt. (1000#)	Rpm	PP
1	8 3/4	HW XIG-J	1020	930	33¼	2	2	11	7	140	1000
2	"	HW XIG-J	1340	320	17½	1	1	1	5	140	900
3	"	HW XIG-J	1406	66	4½	1	1	1	2-5	140	900
4	17½	HW OSC-J	373	283	12½	1	1	1	10	160	400
5	12¼	HW OSC3-J	1410	1037	24 3/4	1	2	1	10	160	550
6	8 3/4	HW XIG (RR)	1535	195	11½	1	1	1	5	160	550
7	17½	HW OSC-J (RR)	1385	1295	48¼	2	2	1	10-20	160	550
8	17½	HW OSC-J	1422	37	2 3/4	1	1	1	20	160	550
9	12¼	HW OSC-3	1522	100	3½	1	2	1	15	160	550
10	17½	HW OSC-J (RR)	1522	137	7½	1	2	1	20	160	800
11	8 3/4	HW XIG-J	1971	449	43½	3	1	1	2-5	120	400
12	8 3/4	HW XIG-J	2219	248	27½	2	1	1	2-5	120	400
13	"	HW XIG-J	2395	176	21½	3	1	1	2-5	120	650
14	"	HW XDV-J	2771	376	33¼	5	1	1	25-30	60-80	800
15	"	HW XDV-J	2890	119	18 3/4	6	1	1	20-30	60-120	1150
16	"	HW WD7-J	3110	220	22	4	3	1	10-20	50-120	1150
17	"	HW X55R-J	3160	50	7	1	1	1	10-20	45	1150
18	"	HW WD7-J	3267	107	19¼	8	3	1	10-20	120	1150
19	"	HW X55R(RR)	3458	191	37¼	3	3	1	8-20	40-60	1150
20	"	HW ODV-J	3492	34	7½	8	3	1	8-10	90-120	1150
21	"	HW X55R-J	3709	217	31½	2	4	1	8-10	40-160	1150
22	"	HW WD7	3810	101	16	4	2	1	8-15	85-90	1250
23	"	HW WD7	3831	21	4	3	2	1	15	90	1250
24	"	HW WD7	3914	83	13¼	3	2	1	15-20	70	1150
25	"	HW X55R	4346	432	42	1	2	1	8-10	70	1150
26	"	HW WDR	4477	131	19½	3	3	1	10-30	50-70	1250
27	"	HW WDR	4611	134	18	3	2	1	10-15	60-70	1150
28	"	HW X55R	5131	520	59¼	1	2	1	10-15	75	1200
29	"	HW WDR	5338	207	35½	4	7	1	10	80	1200
30	"	HW X55R	6094	756	78½	1	4	1	30	50	1200
31	"	HW WD7	6278	184	33½	7	6	1	25	75	1200
32	"	HW X55R	7217	939	96½	2	8	1	35	50	1300
33	"	HW X55R	7757	540	55½	1	5	1	35	50	1450
34	"	HW X55R	8120	363	33	2	8	1	35	50	1250

BIT #	SIZE	MAKE & TYPE	DEPTH OUT	FOOTAGE	HOURS RUN	DULL COND. T	B	G	WT. (1000#)	RPM	PP
35a	8 3/4	HW WD7	8120 Ream	354	2½						
35b	"	HW WDR HW WDR (RR)	Condition Hole Clean Hole								
36	"	HW X55R	8300	180	14	1	1	1	35	50	1100
37	"	HW X55R (RR)	8894	594	63 3/4	4	4	1	40	45	1100
38	"	HW X55R	9661	767	58¾	6	8	1	30	45	1100
39	"	HW X55R	10,168	507	65¼	5	8	1	40	45	1100
40	"	HW X55R	10,959	791	100 3/4	2	1	1	35	45	1100
41	"	HW X55R	11,653	694	88¾	6	8	1	40-45	45	1100
42	"	HW X55R	12,452	799	100½	2	6	1	30	45	1150
43	"	HW X55R	12,928	477	51½	6	8	1	30	45	1150
44	"	HW X55R	13,123	195	36	1	1	1	10-20	45	1150
45	"	HW WD7	13,153	30	22 3/4	5	2	1	3	50	1150
46	"	HW X55R (RR)	13,248	95	18½	2	1	1	12	50	1150
47	"	HW WDR	13,340	92	21	3	2	1	15	60	1100
48	"	HW X55R	13,756	416	55 3/4	1	2	1	10	60	1100
49	"	HW X55R (RR)	14,037	281	76	1	2	1	10	60	1100
50	6 3/16	Diamond	14,043	6	2¼	Good			5-7	50	1400

SECTION III

(d) MUD REPORT

DATE	DEPTH	Wt.	Vis.	Wl	pH	ADDITIVES	REMARKS
Apr. 22	67					Gel 35 sx, Bicarb 5 Sx, Benex 7 sx	Drilling 26" Conductor Hole. Spud. Apr. 18
" 23	90					Gel 27, Benex 2.	Run 20¾" Cond.Pipe
" 24	480	8.5	45			Gel 35, Benex 5.	Spud 8 3/4" Pilot Hole 12:15 AM,Apr.24
" 25	905	8.6	42			Gel 45, Benex 7.	Drlg 8 3/4" Pilot
" 26	1300	8.7	45			Gel 45, Bicarb 3, Ben.7	Hole. " "
" 27	1406	8.8	65			Gel 60, Benex 11.	Ream. Pilot Hole-10½"
" 28	1406	9.0	75			Gel 35, Benex 7	Ream P.Hole - 12¼"
" 29	1535	9.2	65			Gel 50, Benex 9	Drill & ream P. Hole to 17½"
" 30	1070	9.4	65			Gel 10, Benex 2	Ream P. Hole to 17½"
May 1	1415	9.0	70			Gel 30	Ream Pilot Hole
" 2	1522	9.1	95			Nil	Run Surf. Csg.
" 3	1522					Nil	WOC
" 4	1660	9.5	35			Gel 30, Bicarb 2, B-Ex6	Drlg. 8 3/4" hole
" 5	1811	8.9	36			Gel 60, Bicarb 2,B-Ex 12	" "
" 6	1971	8.8	35		8.0	Gel 43, B-Ex 10	
" 7	2185	8.8	36	19.5	8.5	Gel 66, B-Ex 14	Drlg. in v.f SS, Sh, & SltS
" 8	2338	8.7	35	15.8	8.5	Gel 35, B-Ex 7	
" 9	2475	8.7	44	15.8	8.0	Gel 51, B-Ex 10	
" 10	2762	8.7	42	16.0	8.0	Gel 48, B-Ex 11	
" 11	2874	8.8	40	16.8	8.0	Gel 57, B-Ex 11	V hd, f-m, silic SS
" 12	3080	8.8	38	16.8	8.0	Gel 27, B-Ex 7	
" 13	3190	8.8	40	16.6	8.0	Gel 23, B-Ex 6	
" 14	3300	8.9	40	13.2	9.0	Gel 22, Bicarb 2, B-Ex 6	
" 15	3413	8.9	45	13.4	9.0	Gel 64, B-Ex 17	
" 16	3492	8.9	55	13.2	9.0	Gel 23, B-Ex 6	
" 17	3640	8.9	40	13.6	9.0	Gel 46, B-Ex 12, Soda Ash 2	
" 18	3724	8.9	46	13.8	9.0	Gel 23, B-Ex 5	
" 19	3831	9.0	40	13.6	8.5	Gel 24, B-Ex 6, S A 2	SS, Slt/S & Shales i-bedded
" 20	3886	9.0	40	13.6	8.0	Gel 26, B-Ex 6	
" 21	4021	8.9	48	13.8	8.5	Gel 56, B-Ex 14,SA 1	Silic SS w/strngrs &
" 22	4162	8.8	48	13.8	8.0	Gel 40, B-Ex 9,Caus 2sx.	i-beds Sh & silic Slt/S
" 23	4327	8.8	46	13.4	9.0	Gel 65, B-Ex 16,Caus 1	
" 24	4440	8.8	52	12.0	9.0	Gel 48, B-Ex 12,Caus 1	SS,Aa w/strngrs of Sh & Slt/S

DATE	DEPTH	Wt.	Vis.	WL	pH	ADDITIVES	REMARKS
May 25	4565	8.7	46	12.4	8.5	Gel 44, B-Ex 11,Caus 2	SS,Aa w/strngrs Sh & Slt/S
" 26	4700	8.9	45	13.6	8.5	Gel 57, B-Ex 13,Caus 1	
" 27	4880	8.8	47	13.4	9.0	Gel 59,B-Ex 15, Caus 3	"New" Sh; gy-blk, slty, mm, hd.
" 28	5040	8.8	54	12.8	9.5	Gel 81, B-Ex 12,Caus3, Peltex 25#	
" 29	5141	8.8	54	12.8	9.5	Gel 53, B-Ex 13, Caus 3	"
" 30	5270	8.9	48	10.8	9.0	Gel 81, B-Ex 20, Caus 1 Pelt. 25#	
" 31	5364	8.9	51	12.4	9.5	Gel 58, B-Ex 14, Caus 2 Pelt. 25#	"
June 1	5540	8.9	50	8.6	9.5	Gel 60, B-Ex 15, Caus 2 Pelt 25#, CMC(852) 2	"
" 2	5757	8.9	50	10.4	9.0	Gel 44, B-Ex 11	
" 3	5980	9.0	50	8.8	9.5	Gel 64, B-Ex 16, Caus 3, Pelt 25#	Bituminous Sh.
" 4	6111	9.0	47	9.6	9.5	Gel 20, Caust 2	Mid. Dev. LS; arg, silic
" 5	6229	8.9	53	9.8	9.5	Gel 60, B-Ex 20,Caus 1.	"
" 6	6331	8.9	54	9.2	9.0	Gel 48, B-Ex 12, Caus 1	"
" 7	6538	8.9	52	9.8	9.5	Gel 55, B-Ex 14, Caus 2	"
" 8	6752	8.9	52	10.0	9.5	Gel 76, B-Ex 19,Caus 1	
" 9	6990	8.9	52	10.8	9.5	Gel 48, B-Ex 12, Caus 2	
" 10	7210	8.9	51	10.2	9.5	Gel 66, B-Ex 17, Caus 1	
" 11	7301	9.0	60	9.8	9.0	Gel 26	
" 12	7526	8.9	55	10.4	9.5	Gel 45, B-Ex 8, Caus 2	
" 13	7738	8.9	50	9.6	9.5	Gel 55, B-Ex 14,Caus 2 CMC(852) 2	LS,Aa w/Dol Strngrs
" 14	7916	8.9	68	9.8	10.0	Gel 53, B-Ex 12,Caus 3	
" 15	8120	9.0	67	9.4	9.5	Gel 76, B-Ex 17	Dolomite
" 16	8120	9.1	93	9.2	9.5	Gel 30, CMC(852) 2, Caus 1	D.S.T. #1
" 17	8120	9.1	99	6.8	9.5	Gel 10, B-Ex 7, Caus 2, CMC(852) 1	Logging
" 18	8248	9.0	68	8.6	9.5	Gel 10, Caus 2, DV68 1 gal. CMC(852) 1	Dolo, Aa
" 19	8308	9.0	93	8.2	9.0	Gel 31, Caus 3,DV68 2 gal, CMC(852) 2	D.S.T. #2
" 20	8516	9.0	68	8.0	9.5	Gel 31, Caus 3, DV68 4 g	
" 21	8715	9.0	63	8.2	9.5	Gel 36, DV68 4 g	
" 22	8894	9.0	70	9.4	9.5	Gel 17, DV68 2 g	
" 23	9144	9.0	77	10.6	9.0	Gel 16, DV68 2, Caus 2	
" 24	9498	9.0	67	11.0	9.5	Gel 34, DV68 4, Caus 2, CMC(852) 2	
" 25	9661	9.0	73	9.8	9.5	Gel 18, DV68 2,	
" 26	9736	9.0	62	9.4	9.0	CMC(852) 1, KZ 2 sx.	Chgd Mud System to Gel - Kelzan-AL
" 27	9927	8.9	55	8.6	9.0	Gel 25, Caus 1, CMC(852) 2, Kz 4.	
" 28	10,100	8.9	63	9.4	9.0	Dowcide B 100#, Caus 2	
" 29	10,175	9.1	70	9.0	9.5	Gel 10, Caus 2, Kz 2	
" 30	10,349	9.1	62	9.4	9.5	Gel 50, Caus 4, Kz 4	

DATE	DEPTH	Wt.	Vis.	WL	pH	ADDITIVES	REMARKS
July 1	10,512	9.2	75	9.3	9.5	Dow B 25#	
" 2	10,715	9.2	80	10.0	9.5	Gel 25, Caus 1, Dow B 25# Kz 2, CMC(852) 2	
" 3	10,883	9.3	74	6.1	9.5	Caus 3	
" 4	11,000	9.3	73	7.1	9.5	Gel 15, Dow B 50#, Kz 1	
" 5	11,204	9.3	74	5.8	10.5	Gel 10, Caus 2, Kz 1	
" 6	11,368	9.3	80	6.8	10.5	Caus 2	
" 7	11,547	9.3	83	7.8	10.5	Caus 2	
" 8	11,636	9.3	45	6.8	10.5	CMC(852) 2, Dow B 50#	
" 9	11,713	9.5	85	6.8	10.5	Nil	
" 10	11,895	9.5	85	7.0	10.5	Gel 10, Caus 2, Kz 1	
" 11	12,097	9.5	63	8.4	10.5	Gel 27, CMC(852) 2, Kz 1	
" 12	12,294	9.3	75	6.6	10.5	Gel 35, Caus 2, Kz 1, Dow B 50#	
"" 13	12,452	9.3	70	6.8	10.5	Gel 20	
" 14	12,571	9.4	75	6.8	9.5	Gel 32, Caus 2, Kz 1	
" 15	12,773	9.4	86	8.6	10.5	Gel 25, Caus 2, CMC(852) 2	
" 16	12,928	9.4	91	77.2	10.0	Caus 2	
" 17	13,022	9.4	85	7.2	10.5	CMC(852) 2	
" 18	13,123	9.4	85	6.2	10.0	Nil	
" 19	13, 132	9.4	90	6.8	9.5	Gel 10, Caus 2	
" 20	13,153	9.4	84	4.0	10.5	Gel 10	
" 21	13,239	9.4	84	6.4	9.5	Gel 15, Caus 2, Kz 1, Dow B 25#	
" 22	13,248	9.5	116	616	10.5	Nil	
" 23	13,248					Gel 20	Logging
" 24	13,248					Nil	
" 25	13,248	9.5	115			CMC(852) 1, Kz 3, Dow B 50#	
" 26	13,313	9.5	104	8.6	9.5	Gel 15, Caus 2, CMC 1	
" 27	13,383	9.6	148	8.8	9.5	CMC(852) 3	
" 28	13,507	9.6	110	8.2	10.0	Caust 2, Kz 1, Dow B 50#	
" 29	13,700	9.7	118	8.0	10.5	Nil	
" 30	13,756	9.6	111	7.8	10.0	Caust 1, CMC 1, Dow B 50#	
" 31	13,803	9.6	103	7.8	10.5	Gel 21	
Aug. 1	13,871	9.6	85	7.4	10.0	Gel 21, Caus 1, KZ 1	
" 2	13,958	9.6	94	7.8	10.0	Gel 15, Caus 2, Dow B 100#	
" 3	14,037	9.7	127	7.8	10.0	Nil	
" 4	14,043	9.6	108	7.8	10.0	Nil	T.D.
" 5	14,043						Logging
" 6	14,043	9.7	120	7.8	10.0	Nil	
" 7	14,043	9.7	280			Gel 10, Kz 1, Dow B 50#	
" 8	14,043	9.7	208	7.8	10.0	Nil	
" 11	14,043					Gel 50, Bicarb 3.	

MUD REPORT

SUMMARY OF MUD ADDITIVES

Gel	3245 sacks
Ben-Ex	542 sacks
Caustic	101 sacks
Kelzan -Al	31 sacks
CMC(852) Regular	24 sacks
Bicarbonate of Soda	15 sacks
Soda Ash	7 sacks
Dowcide "8"	675 lbs.
Peltex	125 lbs.
DV-68	21 gal.

SECTION III

(e) SUMMARY OF DEVIATION SURVEYS

Date	Depth	Deviation
Apr. 24	90'	1/8°
	120	1/8
	180	0
	270	1/8
	355	1/4
	450	1/2
	480	2
Apr. 25	511	1 3/4
	540	1 3/4
	572	1 1/2
	635	1 1/4
	698	1 1/4
	761	1 1/2
	824	1 1/2
	887	1 3/4
Apr. 26	1014	2
	1077	1 3/4
	1140	1 3/4
	1202	1 3/4
	1265	1 3/4
Apr. 27	1328	2
	1380	2 1/4
	1406	2 1/4
Apr. 29	1410	2 1/4
	1459	2 1/4
	1535	2 1/2
May 2	1415	2 1/2
	1522	2 1/2
May 4	1619	3 1/4
	1650	3 3/4
May 5	1682	3 1/2
	1713	4
	1745	3 3/4
	1777	3 1/2
	1807	3
May 6	1839	3
	1871	3
	1902	3 1/4
	1933	3
	1964	3
May 7	1994	2 3/4
	2024	2 3/4
	2056	3
	2087	3
	2119	3 1/2
	2150	3 1/4
	2182	3 1/4
May 8	2213	3 3/4
	2244	3 1/2
	2276	3 1/4
	2307	3 1/8
	2338	3 1/8
May 9	2370'	3°
	2403	2 3/4
	2427	2 7/8
	2459	2 1/4
May 10	2491	2 1/8
	2522	1 1/2
	2554	1 1/4
	2585	1 1/8
	2617	1 1/8
	2648	1
	2680	7/8
	2710	1
	2741	1
May 11	2773	2 3/4
	2809	2 3/4
	2791	2 3/4
	2840	2 3/4
	2872	2 1/8
May 12	2890	2 1/2
	2903	2 1/4
	2935	2 3/4
	2967	3 1/8
	2998	3 1/8
	3030	3 3/4
	3060	3 1/2
May 13	3090	3 3/4
	3110	3 7/8
	3122	4
	3160	4 3/4
	3186	4 1/4
May 14	3217	4
	3245	4
	3267	3 7/8
	3280	3 7/8
May 15	3311	4 7/8
	3343	5
	3374	5 1/8
	3405	5 1/2
May 16	3436	5 3/4
	3458	5 1/2
	3467	5 3/4
	3492	5 1/8
May 17	3530	5 1/4
	3560	5 1/4
	3592	5 1/4
	3622	5 1/2
May 18	3655	6
	3676	5 3/4
	3708	6
May 19	3741	5 3/4
	3777	5 3/4
	3808	5 3/4

Date	Depth	Deviation
May 20	3844	5 3/4
	3876	5 3/8
May 21	3907	5 7/8
	3943	6
	3978	6 1/8
	4007	6 1/8
May 22	4038	6 1/2
	4128	6 1/2
	4159	7 1/4
May 23	4190	6 3/4
	4220	6 7/8
	4252	7
	4285	6 1/8
	4315	6 1/2
May 24	4345	7
	4382	6 3/4
	4414	6 3/8
May 25	4444	6 1/8
	4475	7
	4507	6 5/8
	4538	6 5/8
May 26	4570	6 3/4
	4602	6 3/4
	4611	6 3/4
	4632	6 5/8
	4664	6 1/8
	4695	6 1/8
May 27	4727	6 3/8
	4758	6 3/8
	4820	6 1/4
	4850	6 3/4
	4880	6 1/8
May 28	4912	6 3/4
	4945	7 1/4
	4975	7 3/8
	5004	7 1/8
	5035	7
May 29	5067	7 1/8
	5098	7 3/4
May 30	5167	7 1/4
	5193	7 1/4
	5225	7 1/4
	5256	6 7/8
May 31	5287	6 7/8
	5321	6 3/4
	5360	6 3/4
June 1	5392	6 1/4
	5429	6 1/4
	5456	6 1/4
	5487	6
	5517	5 1/2

Date	Depth	Deviation
June 2	5550	5 1/4
	5581	5 3/4
	5642	5 1/2
	5700	5
June 3	5765	5 1/2
	5830	5 1/2
	5845	4 1/4
	5960	5
June 4	6016	7
	6048	6 1/2
	6080	7
June 5	6141	6 3/4
	6172	6 1/4
	6203	6
June 6	6234	5 1/2
	6278	4 3/4
June 7	6330	5 1/4
	6363	4 1/4
	6425	4
	6485	3 1/2
June 8	6550	3 1/4
	6614	3 3/4
	6677	3 1/2
	6740	2 3/4
June 9	6804	3
	6899	2 1/2
June 10	6990	1 3/4
11	7215	1 1/4
13	7550	1
14	7757	3/4
15	8100	3/4
19	8300	1 1/4
21	8539	2 3/4
	8640	2
22	8758	3 1/2
	8850	3 3/4
	8890	3 3/4
23	8981	3
25	9660	1 1/2
29	10168	2 1/2
July 4	10,959	3/4
9	11,653	2 3/4
13	12,452	3 1/2
16	12,928	8 1/2
18	13,123	16
20	Ran Eastman multishot every 30' from 13,140' - 11,995	
	11,995	3
	12,026	3
	12,057	3

Date	Depth	Deviation
July 20	(cont'd.)	
	12,088'	2 3/4°
	12,119	3
	12,150	2 1/2
	12,181	2
	12,212	2 1/2
	12,243	2 1/2
	12,274	3
	12,305	3
	12,336	3
	12,367	3
	12,398	3
	12,429	3
	12,460	3
	12,491	3
	12,522	3 1/2
	12,553	4
	12,584	4 1/2
	12,615	5 1/2
	12,646	6 1/2
	12,677	7
	12,708	7 3/4
	12,739	8
	12,770	8 1/2
	12,801	8
	12,832	8
	12,863	9
	12,894	9
	12,925	9
	12,956	9
	12,987	12
	13,018	13 1/2
	13,049	15
	13,079	15
	13,109	15 1/2
	13,140	16

Date	Depth	Deviation
July 22	13,248'	17°
27	13,338	18
28	13,470	17
29	13,700	24
30	13,754	26
31	13,803	>24
	Ran Schlumberger Surveys from 13,338' - 13,700'	
	13,338	18
	13,470	17
	13,700	24
Aug. 1	13,820	25
2	13,890	24
3	14,000	24

SECTION III

(f) ABANDONMENT PLUGS

Plug #1: 10,700' to 10,800', with 80 sacks + 2% $CaCl_2$. Felt @ 10,592'. Polished off to 10,608'.

Plug #2: 8,100' to 8,200', with 75 sacks + 2% $CaCl_2$. Felt @ 8074'.

Plug #3: 6,000' to 6,100', with 75 sacks + 2% $CaCl_2$. Felt @ 5947'.

Plug #4: 3,900' to 4,100', with 130 sacks + 5% sand + 2% $CaCl_2$. Felt @ 3840'. Polished off to 3846'.

Plug #5: 1,475' to 1,575', with 110 sacks cement. Felt @ 1420'

Surface: 5 sack plug & steel plate. Identification marker erected.

SECTION IV

LOGS

(See Attachment)

Date Run	Type	Scale and Interval
June 16	I.E.S.	2" - 1522' - 8071' 5" - 5960' - 8071'
" "	Sonic	2" - 1522' - 8059' 5" - 5960' - 8059'
" "	Caliper	2" - 1522' - 8060' 5" - 5020' - 8060'
" 17	Dipmeter	5" - 1522' - 8048'
" "	Directional	5" - 1522' - 8049'
July 22	I.E.S.	2" - 7800' - 13,234 5" - 7800' - 13,234
" "	Sonic	2" - 7800' - 13,233 5" - 7800' - 13,233
" 23	Directional	5" - 8100' - 13,235
Aug. 4	I.E.S.	2" - 8000' - 14,030 5" - 8000' - 14,030
" 4	Sonic	2" - 13,013' - 14,013 5" - 13,013' - 14,013
" 4	Dipmeter	5" - 7,900' - 14,026
" 4	Directional	5" - 13,300' - 14,027
" 5	SNP	2" - 8700-11,200; 11,600-12,000; 12,700-14,013 5" - " " " " " "
" 5	Density	2" - 8700-11,200; 11,600-12,000; 12,700-14,014 5" - " " " " " "

CHEMICAL & GEOLOGICAL LABORATORIES LTD. WATER ANALYSIS Lab No. C70-2245

Received: Sept. 11,1970 Reported: Sept. 17,1970 Well: Location: W.M.N. Hope Y T N-53

Operator: WESTERN MINERALS LTD. Field or Area: W.C.

Elev.: K.B. Grd. Zone/Formation: Ord. Sample Interval: 10845' - 10970'

Method of Production: Test #3 Sampled from: 450' Above Tool Sampled by: Date: Aug. 7, 1970

OTHER PERTINENT DATA

Recovery: 3040 W. Cush., 100' My.F.W., 450' Sl.gcm

(Signed)

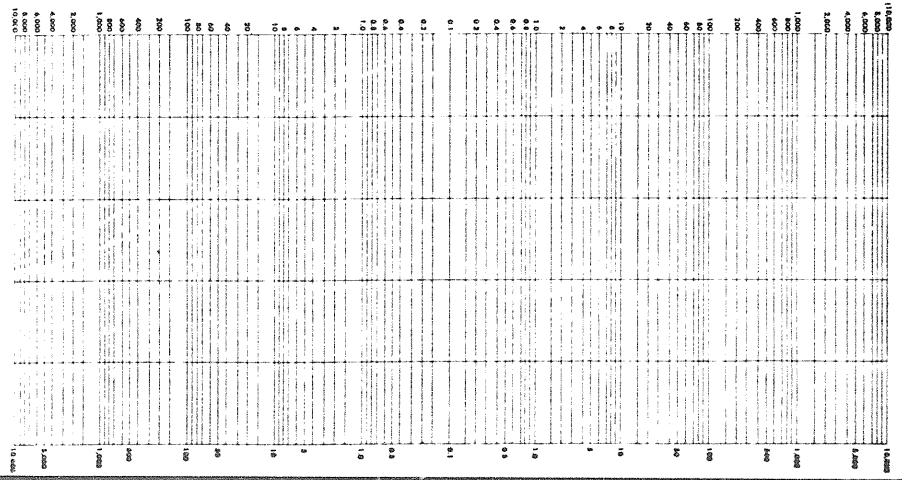
	Na	K	Ca	Mg					SO_4	Cl			CO_3	HCO_3		
L																

- 69 -

Total Solids Mg/L: By Evaporation — Fe — Specific Gravity — @60°F Observed pH — @ °F

Calculated — After Ignition — H_2S — Refractive Index — @25°C Resistivity 2.57 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks and Conclusions

The samples as received were grey muds. The filtrates were colorless.

LABORATORY NUMBER	SAMPLED FROM	RESISTIVITY (Ohm-meters at 68°F.)
C70-2245-2	Above Tool	1.6

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

WATER ANALYSIS

Lab No. C70-2245-7

Received: Sept. 11,1970 Reported: Sept. 17, 1970

Operator: WESTERN MINERALS LTD.

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

Well: Location: W.M.N. Hope YT N-53

Field or Area: W.C.

Sample Interval: 10845' - 10970'

Method of Production: Test #4 Sampled from: 7590' Above Tool Sampled by: Date: Aug. 8,1970

OTHER PERTINENT DATA Recovery: 275' My. F.W., 3490' Sl.gcw cush., 2560' sl.gcm., 1730' sulf. wtry. m.

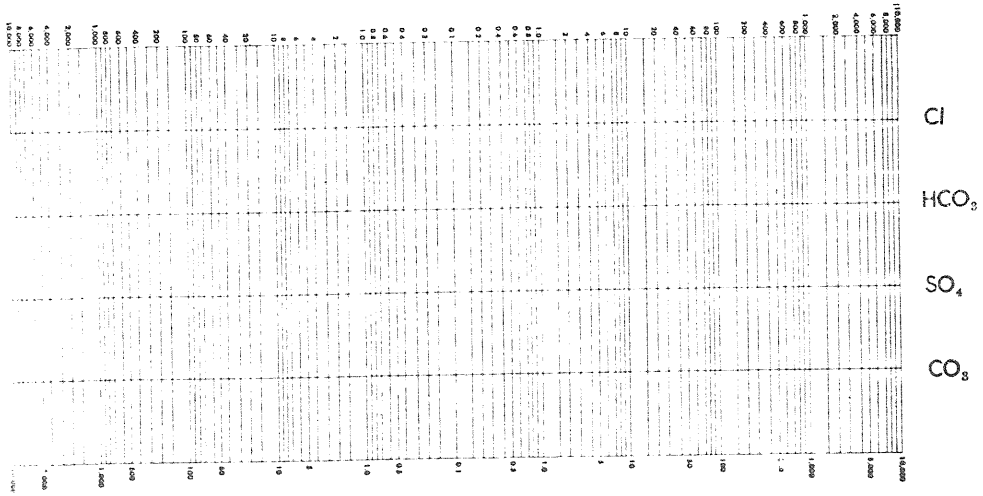
(Signed)

Na	K	Ca	Mg					SO_4	Cl			CO_3	HCO_3		
110		5	1					Trace	20			30	210		
4.67		0.25	0.08					Trace	0.56			1.00	3.44		
46.70		2.50	0.80						5.60			10.00	34.40		

Total Solids Mg/L: By Evaporation 500 Fe Much Specific Gravity 1.001 @60°F Observed pH 8.7 @ 80 °F

Calculated 376 After Ignition 234 H_2S Nil Refractive Index 1.3330 @25°C Resistivity 22.8 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks and Conclusions

The sample as received contained a trace red sediment. The filtrate was deep yellow in color.

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

WATER ANALYSIS

Lab No. C70-2245

Received: Sept. 11,1970 Reported: Sept. 17,1970

Well: Location: W.M.N. Hope YT N-53

Operator: WESTERN MINERALS LTD.

Field or Area: W.C.

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

Sample Interval: 10845' - 10970'

Method of Production: Test #4 Sampled from: Above Tool Sampled by: Date: Aug. 8,1970

OTHER PERTINENT DATA Recovery: 275' My.F.W., 3490' Sl.gc w. cush., 2560' sl.gcm., 1730' sulf. wtry.m.

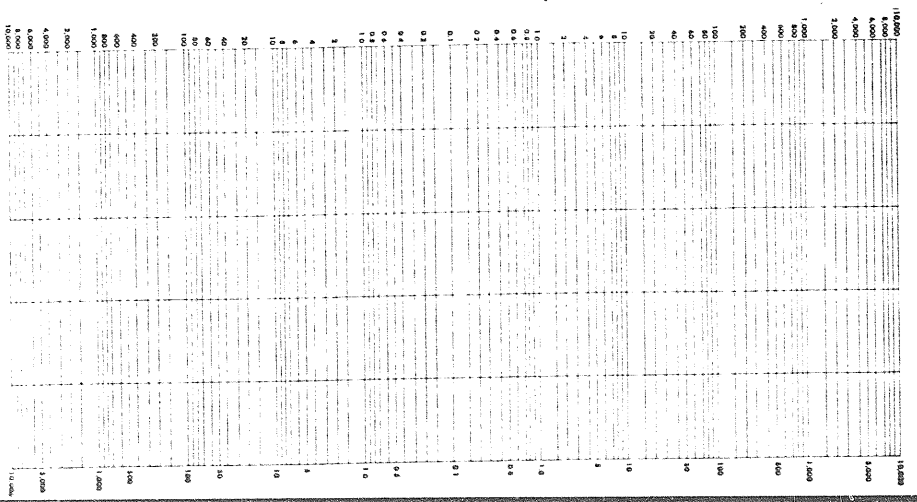
(Signed)

	Na	K	Ca	Mg					SO_4	Cl			CO_3	HCO_3		
L	22,000		5200	830					Trace	45,100			----	710		
L	955.75		259.48	68.23					Trace	1271.82			---	11.64		
%	37.23		10.11	2.66						49.55				0.45		

Total Solids Mg/L: By Evaporation 77,100 Fe Much Specific Gravity 1.056 @60°F Observed pH 7.0 @ 80 °F

Calculated 73,840 After Ignition 71.390 H_2S Nil Refractive Index 1.3458 @25°C Resistivity 0.12 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks and Conclusions

The sample as received was a muddy water. The filtrate was colorless.

CGL-4

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

Edmonton – Fort St. John – Calgary

GAS ANALYSIS REPORT: Lab. No. 570-2216 Received: Aug. 21, 1970 Reported: Aug. 27, 1970

Well: Western Minerals N. Hope Y.T. N-53 Operator: WESTERN MINERALS LIMITED

Field or Area: Wildcat Location: Elev.: K.B. Grd.

Zone and Formation: Ordovician Sample Interval: 10,845' - 10,970'

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

Sampled from: Sampled by: Date: Aug. 7, 1970

Pressure: (a) at point of sampling 3785' psig (b) Gas Bomb pressure 70 psig

Temperature: (a) at point of sampling 190 °F (b) Separator °F

Pressures: Reservoir Tubing Casing Separator

OTHER PERTINENT DATA Method of production: D.S.T. #3. Container #1067.

(Signed)

COMPOSITION	% by Volume	G.P.M. in Imp. Gal. @ 60°F. & 14.65 PSIA
Helium	.11	
Hydrogen sulfide	.00	
Carbon dioxide	11.13	
Nitrogen	1.95	
Methane	85.58	
Ethane	1.21	
Propane	.02	.005
Isobutane	.00	.000
N-butane	.00	.000
Isopentane	.00	.000
N-pentane	.00	.000
Hexanes	.00	.000
Heptanes	.00	.000
Octanes	.00	.000
Nonanes	.00	.000
Decanes +	.00	.000
TOTAL	100.00	.005

G.P.M. (Calculated)

pentanes + _____

at 12 lbs. _____

at 15 lbs. _____

at 22 lbs. _____

at 26 lbs. _____

SPECIFIC GRAVITY

Calculated .675

by Weight .673

CRITICALS (Calculated)

Pc 713.6

Tc 366.5

VAPOR PRESSURE (Calc.) @ 100°F. Pentanes + _____

H_2S Grains per 100 cu. ft. @ 60°F. & 14.65 p.s.i.a. 0

GROSS B.T.U. (Calc.) @ 60°F. & 14.65 p.s.i.a. (dry) 883.6

Acid Gas Free 994.3 (sat.) 868.2

DEW POINT (Calc.) p.s.i. 950 1050 1200

-50F -48F -45F

Mol. Wt. Total Gas 19.555 Heptanes + _____

When received, sample pressure was 80 psig. at 75°F.

DATA

SECTION VI

(c) CEMENTATION RECORD

Abandonment Plugs

Plug #1: 10,700 - 10800' with 80 sax cement + 2% retarder. Plug down at 3:00 A.M., Aug. 9. Felt at 10,592'. Polished to 10,608'.

Plug #2: 8,100' - 8,200' with 75 sax cement + 2% $CaCl_2$. PLug down at 9:15 P.M., Aug. 10. Felt at 8,074'.

Plug #3: 6,000' - 6,100' with 75 sax cement + 2% $CaCl_2$. Plug down at 7:15 A.M., Aug 11. Felt at 5947'.

Plug #4: 3,900' - 4,100' with 130 sax cement + 5% sand and 2% $CaCl_2$ Plug down at 5:30 P.M., Aug. 11. Felt at 3840'. Polished to 3846'.

Plug #5: 1,475' - 1,575' with 110 sax. Plug down at 2:00 P.M., Aug. 12. Felt at 1420.

Surface: Ran 5 sack plug to 8:00 A.M., Welded on steel plate to 10:00 A.M., Aug. 13.

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

WATER ANALYSIS Lab No. E71-5472-1

Received: July 21, 1971 Reported: July 22, 1971 Well: Location: Pointea Mtn. B-1

Operator: AMOCO CANADA PETROLEUM COMPANY LTD. Field or Area:

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

Method of Production: Sampled from: Wellhead Sampled by: Zelinski (Porta-Test Engineering Ltd.) Date: July 11, 197 @ 10:30 A.M.

OTHER PERTINENT DATA

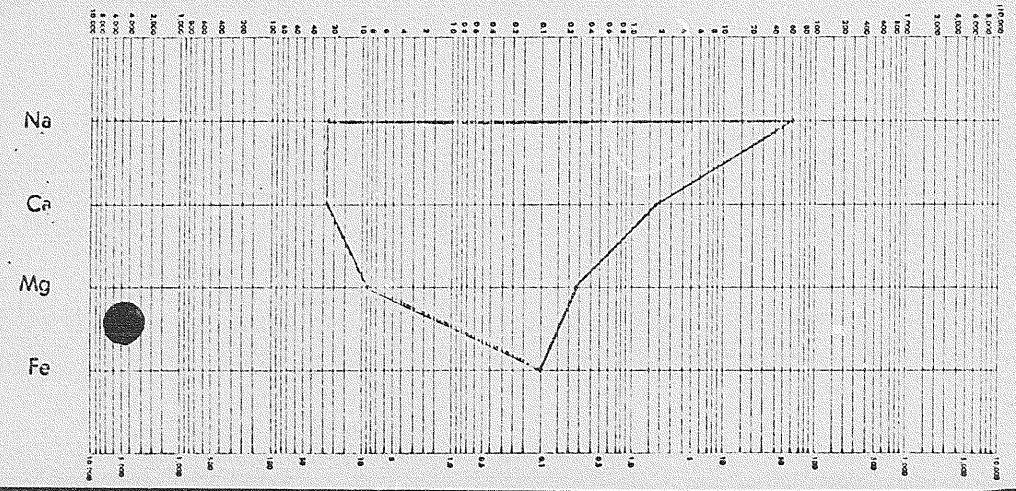
(Signed)

	Na & K	K	Ca	Mg					SO_4	Cl			CO_3	HCO_3		
Mg./L	622		543	108					13	2160			---	112		
Meq./L	27.06		27.07	8.89					0.27	60.91			---	1.84		
Meq. %	21.47		21.48	7.05					0.21	48.33			---	1.46		

Total Solids Mg/L: By Evaporation 5400 Fe Much Specific Gravity 1.007 @60°F Observed pH 4.9 @ 77 °F

Calculated 3558 After Ignition 3376 H_2S Present Refractive Index 1.3337 @25°C Resistivity 1.61 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks and Conclusions

Sample consisted of colorless water with a trace of black sediment. Some organic matter detected in total evaporated solids. Sample is contaminated with spent acid.

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

WATER ANALYSIS Lab No. E71-5472-?

Received: July 21, 1971 Reported: July 22, 1971 Well: Location: Pointed Mtn. B-1 0-46

Operator: AMOCO CANADA PETROLEUM COMPANY LTD. Field or Area:

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

Method of Production: Sampled from: Pot on Flareline Sampled by: Porta-Test Engineering Ltd. Date: July 12, 197

OTHER PERTINENT DATA

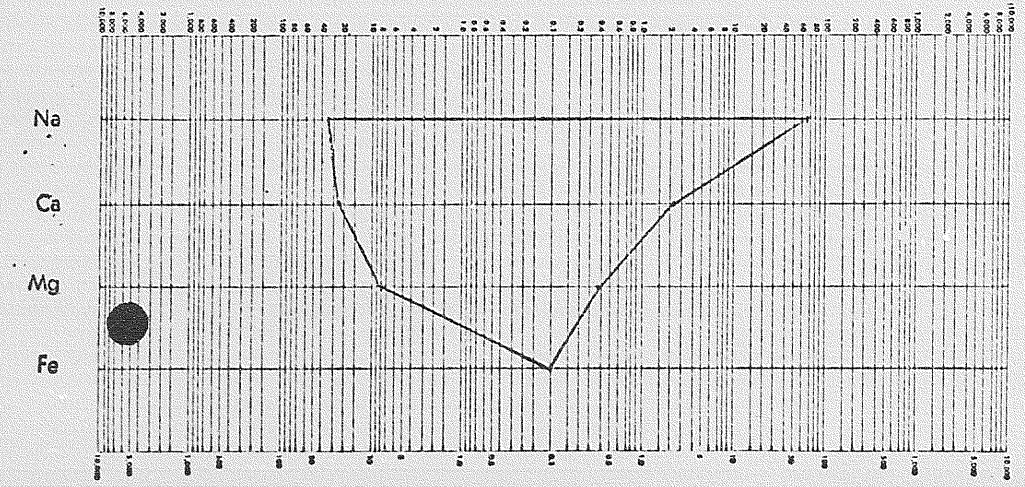
(Signed)

	Na & K	K	Ca	Mg					SO_4	Cl			CO_3	HCO_3		
Mg./L	806		531	102					18	2375			---	156		
Meq./L	35.06		26.47	8.39					0.38	66.98			---	2.56		
Meq. %	25.07		18.93	6.00					0.27	47.90			---	1.83		

Total Solids Mg/L: By Evaporation 5536 Fe Much Specific Gravity 1.007 @60°F Observed pH 5.3 @ 78 °F

Calculated 3988 After Ignition 3584 H_2S Present Refractive Index 1.3338 @25°C Resistivity 1.56 ohm meters @ 68 °F

Pattern Unit Meq./L



Remarks and Conclusions

Sample consisted of colorless water with a trac of black sediment. Some organic matter detected in total evaporated solids. Sample is contaminated with spent acid water.

CGL 4

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

Edmonton – Fort St. John – Calgary

GAS ANALYSIS REPORT: Lab. No. 71-6013 Received: Sept. 1, 1971 Reported: Sept. 13, 1971

Well: Amoco Pointed Mtn. B-1 0-46 Operator: AMOCO CANADA PETROLEUM COMPANY LTD.

Field or Area: Location: Elev.: K.B. Grd.

Zone and Formation: Sample Interval:

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

Sampled from: Sampled by: Date: Aug. 21, 1971

Pressure: (a) at point of sampling 1414 psig (b) Gas Bomb pressure psig

Temperature: (a) at point of sampling 46 °F (b) Separator °F

Pressures: Reservoir Tubing Casing Separator

OTHER PERTINENT DATA Sampled at 8:00 A.M. from Wellhead CONTAINER No's 2022, 2159

(Signed)

COMPOSITION	% by Volume	G.P.M. in Imp. Gal. @ 60°F. & 14.65 PSIA
Helium	0.06	
Hydrogen sulfide	0.53	
Carbon dioxide	10.93	
Nitrogen	1.27	
Methane	87.13	
Ethane	0.03	
Propane	0.	0.
Isobutane	0.	0.
N-butane	0.	0.
Isopentane	0.	0.
N-pentane	0.	0.
Hexanes	0.	0.
Heptanes	0.	0.
Octanes	0.	0.
Nonanes	0.	0.
Decanes +	0.	0.
TOTAL	100.00	0.

G.P.M. (Calculated)

pentanes + 0.

at 12 lbs. 0.

at 15 lbs. 0.

at 22 lbs. 0.

at 26 lbs. 0.

SPECIFIC GRAVITY

Calculated 0.668

by Weight .670

CRITICALS (Calculated)

Pc 717.3

Tc 355.2

VAPOR PRESSURE (Calc.) @ 100°F. Pentanes + 0.

H_2S Grains per 100 cu. ft. @ 60°F. & 14.65 p.s.i.a. 853.

GROSS B.T.U. (Calc.) @ 60°F. & 14.65 p.s.i.a. (dry) 991.4

(sat.) 956.0

Acid Gas Free (dry) 991.9

DEW POINT (Calc.) p.s.i. 950 1050 1200

FAH. -52 -52 -47

Mol. Wt.: Total Gas 19.353 Heptanes + 0.

Received at 1450 psig. at 76°F. Prior to analysis sample was heated to 180°F.