764508 ALBERTA LIMITED

(formerly KNOWLING GEOLOGICAL SERVICE)

Geological Report

NORTHROCK et al East MacKay I-77

I - 77 - 64 - 50 - 125 - 30

N.W.T.

By:

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P.Geol

24-Jan-00

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WELL DATA:

Operator: Northrock Resources Ltd. **AFE:** 990437

Well Name: NORTHROCK et al E.MacKay I-77 **Wid #:** 1879

Field: Undefined **UWI:** 300I776450125300

Surface Location: I-77-64-50-125-30

Surface Co-ordinates: Lat: 64 46'41 610" Long: 125 43'10 277" (NAD83)

Well Status: Exploratory, Plugged and Abandoned

Contractor: Akita/Sahtu Ptnshp. **Rig:** 51

Spud Date: 23-Dec-99 @ 0930hrs **TD Date:** 19-Jan-00 @ 2215hrs

Total Depth: 2400.00m Driller **Rig Release:** 23-Jan-99
2399.00m Logger

Elevations: **Kelly Bushing:** 202.35m **Ground Level:** 198.10m

Hole Size: 311mm to 615m, 222mm to FTD.

Casing Record:
Surface Casing: 244.5mm, 53.6m kg/m, ST&C, J-55, set at 615.0m.

Mud Type: Floc water to 1600m. Gel/chem to FTD.

Logs Run:

BHCS-GR-CAL	TD-SC	GR to Surface
CNL-LDT-PE-GR-DAC/AIT-SP	TD-SC	Hi Res 2175-2250m

Drill Stem Tests:
#1 2175-2204m Arnica 5-60-60-180
Failed 4 minutes into preflow. Recover 40m mud, 74m mud & SW, and 56m SW. Packers failed. No mud drop.

Rotating Hours:

Surface Hole:	118.25 hrs
Main Hole:	287.75 hrs

Supervision:

Foreman:	Bruce Webber
Geologist:	David N.K.Roberts

FORMATION TOPS:

Elevations: Ground Level: **198.10m** Kelly Bushing: **202.35m**

Formation	Prog MD	Prog SS	Smpl MD	Log MD	Log SS
Little Bear	833.4	- 631	790	770.0	- 567.6
Slater River	1226.4	-1024	1207	1213.5	-1011.1
R/A Shale	1464.4	-1262	1449	1454.0	-1251.6
Devonian Imperial	1497.4	-1295	1521	1525.0	-1322.6
Turbidite	1722.4	-1520	1715	1727.5	-1525.1
Hare Indian Shale	1856.4	-1654		1871.0	-1668.6
Bluefish	1967.4	-1765		1987.0	-1784.6
Hume	1984.4	-1782	2006	2006.0	-1803.6
Headless	2300.4	-2098		2059.0	-1856.6
Landry				2143.0	-1940.6
Arnica				2183.0	-1980.6
White Dolomite				2254.0	-2051.6
Pink Dolomite				2378.0	-2175.6
Bear Rock	2330.4	-2128	Not seen		
Total Depth	2408.4	-2206	2400	2399.0	-2196.6

BIT RECORD:

Bit	Size	Type	Depth Out	Meters	Hours	WOB dan	RPM	Condition
1a	311	Reed HP13G	122	122	17.25	2-5	140	N/A
2a	311	Smith MFDSS	236	114	30.00	2-3	140	N/A
3a	222	Hughes GT-SG1	290	64	13.25	2-3	160	Drill pilot hole.
4a #2rr	311	Smith MFDSS	465	229	28.00	12	50	N/A
5a	311	Smith MFDSSHC	615	150	29.75	12	50	N/A
1 #3rr	222	Hughes GT-SG1	1031	416	47.75	12	90	Good
2	222	Hughes GT-SG1	1224	193	47.75	6-8	50 +mudmotor	Good
3	222	Hughes GT-G1	1414	190	38.75	10-14	50 +mudmotor	Good
4 (MWD)	222	Hughes GT-S20	1983	759	65.00	15-17	30 +mudmotor	BT on heel.
5 (MWD)	222	Hughes GT-S09C	2055	72	10.00	15-18	30-40 +mudmotor	Bit scrubbed.
6 (MWD)	222	Hughes ATJ-44	2270	215	36.75	14-18	40 +mudmotor	Good
7 (rot)	222	Hughes GT-S20	2342	72	22.75	14-18	85	Bit scrubbed.
8 #6rr (rot)	222	Hughes ATJ-44	2400	58	19.00	15-20	65	Good

SURVEYS

Depth	Inclination	Depth	Inclination
21m	1.00	620m	0.50
34m	1.07	670m	0.50
41m	0.75	720m	0.25
62m	0.50	765m	0.75
90m	0.75	810m	0.87
162m	1.00	858m	0.87
190m	1.00	919m	1.00
227m	1.25	960m	1.87
236m	1.25	998m	1.75
244m	1.00	1017m	1.87
253m	1.50	1050m	1.87
263m	1.00	1065m	1.75
272m	0.87	1096m	1.50
290m	0.50	1120m	1.50
293m	0.50	1172m	2.00
302m	1.00	1208m	2.25
311m	1.25	1218m	2.12
320m	1.25	1270m	2.12
334m	1.00	1312m	2.12
367m	1.00	1360m	2.87
424m	1.00	1414m	Pick up MWD.
452m	0.75	2396m	1.00
477m	0.75		
519m	1.00		
547m	0.75		
572m	0.75		
615m	1.00		
615m	Set Casing.		

SAMPLE DESCRIPTIONS:

615-620m Cement: 100%

620-625m Cement: 50%.
Shale: 50%, light grey to grey, blocky, very sandy, silty.

625-630m Cement: 15%.
Shale: 85%, as above.

630-635m Cement: 5%.
Sandstone: 95%, white/clear, black, salt and pepper textured, fine grained, very fine grained in part, well sorted, angular to subangular clasts, poorly cemented with silica, quartz overgrowths, mica flakes, good porosity in part.

635-640m Cement: 10%.
Shale: Trace, dark grey to black, subfissile to fissile.
Sandstone: 90%, as above.

640-645m Shale: 5%, as above.
Sandstone: 95%, as above, rare medium grained, quartz overgrowths.

645-650m Shale: 20%, dark grey to black, fissile to subfissile, flat luster.
Sandstone: 80%, as above, generally fine grained, good porosity, quartz overgrowths.

650-655m Shale: 30%, as above, becoming grey and soft.
Sandstone: 70%, as above.

655-660m Shale: 40%, as above.
Sandstone: 60%, as above.

660-665m Shale: 50%, as above.
Sandstone: 50%, as above.

665-675m Shale: 5%, dark grey, fissile.
Sandstone: 95%, white/clear, black, salt and pepper textured, fine grained, in part medium grained, well sorted, angular to subangular clasts, poorly cemented with silica, good porosity, trace chert pebbles and granules.

675-680m Shale: Trace.
Sandstone: 100%, as above.

680-690m Sandstone: 100%, as above, fine grained, in part medium grained, rare coarse grained.

690-695m Shale: 5%, dark grey, fissile, flat luster.
Sandstone: 95%, white/clear, black, salt and pepper textured, fine grained, in part medium grained, rare coarse grained, well sorted, angular to subangular clasts, poorly cemented, good porosity.

695-700m Shale: 90%, as above.
Sandstone: 10%, as above, in part soft.

700-705m Shale: 5%, as above.
Sandstone: 95%, as above.

705-710m Shale: 20%, dark grey, fissile to subfissile, flat luster.
Sandstone: 80%, as above.

710-715m Shale: 5%, as above.
Sandstone: 95%, as above.

715-730m Shale: 30%, grey, soft.
Sandstone: 70%, as above.

730-740m Shale: 40%, as above.
Sandstone: 60%, as above.

740-745m Shale: 70%, grey to dark grey, subfissile to fissile, flat luster.
Sandstone: 30%, as above.

745-750m Shale: 95%, as above.
Sandstone: 5%, as above.

750-755m Shale: 90%, as above.
Sandstone: 10%, as above.

Little Bear log top at 770.0m.

755-770m Shale: 95%, grey to dark grey, blocky to subfissile, micromicaceous in part.
Sandstone: 5%, as above.

770-780m Shale: 5%, as above.
Sandstone: 95%, white/clear, black, salt and pepper textured, fine to medium grained, well sorted, angular to subangular clasts, in part subrounded clasts, poorly cemented with silica, good porosity.

780-785m Shale: Trace.
Sandstone: 100%, as above, coarse grained in part.

785-790m Shale: 100%, dark grey, subfissile to blocky, flat luster.

790-800m Sandstone: 100%, white/clear, black, salt and pepper textured, fine to medium grained, common chert pebbles, well sorted, angular to subangular in part subrounded poorly cemented with silica, good porosity, white grey yellow and orange chert clasts, abundant chert pebbles.

800-805m Sandstone: 100%, as above, becoming moderate to well cemented, tight in part.

805-810m Sandstone: 100%, as above, very fine to medium grained, common to abundant chert pebbles.

810-815m Shale: 5%, dark grey, subfissile to blocky.
Sandstone: 95%, white/clear, black, salt and pepper textured, fine to medium grained, trace chert pebbles, well sorted, angular to subangular clasts, moderately cemented with silica, fair to good porosity.

815-820m Shale: 20%, as above.
Sandstone: 80%, as above.

820-825m Shale: 10%, as above.
Sandstone: 90%, as above, trace chert pebbles.

825-830m Shale: Trace.
Sandstone: 100%, as above.

830-835m Shale: 10%, as above.
Sandstone: 90%, as above.

835-840m Shale: 5%, as above.
Sandstone: 95%, as above.

840-845m Sandstone: 100%, as above.

845-850m Shale: 15%, dark grey, subfissile to blocky.
Sandstone: 85%, white/clear, black, salt and pepper textured, fine to medium grained, well sorted, poor to moderately cemented with silica, fair to good porosity, trace chert pebbles.

850-855m Shale: 60%, as above.
Sandstone: 40%, as above.

855-860m Shale: 50%, dark grey to black, subfissile, carbonaceous in part.
Sandstone: 10%, as above.
Coal: 40%, vitreous to subvitreous, shaley in part.

860-865m Shale: 30%, as above.
Sandstone: 30%, white/clear, black, salt and pepper textured, fine to medium grained, in part coarse grained, subangular clasts, poorly cemented with silica, good porosity.
Coal: 40%, as above.

865-870m Shale: 5%, as above.
Sandstone: 90%, as above, fine to coarse grained, well sorted, subangular to subrounded clasts, poorly cemented, pebbly in part, good porosity.
Coal: 5%, as above.

870-875m Shale: 10%, light to dark grey, subfissile to blocky, silty.
Sandstone: 90%, as above, fine to medium grained.

875-880m Shale: 15%, as above.
Sandstone: 85%, as above.

880-890m Shale: 70%, dark grey, blocky to subfissile, silty.
Sandstone: 30%, as above.

890-895m Shale: 85%, dark grey, blocky, silty.
Sandstone: 15%, as above.

895-905m No sample. Working tight hole and high seepage losses.

905-910m Shale: 90%, dark grey, blocky to subfissile, silty in part, sideritic in part.
Sandstone: 10%, as above.

910-915m Shale: 5%, as above.
Sandstone: 95%, white/clear, black, salt and pepper textured, fine to medium grained, in part common coarse grains, well sorted, angular to subrounded, poor to moderately cemented with silica, trace chert pebbles, good porosity in part.

915-920m Shale: 10%, as above.
Sandstone: 90%, as above, becoming well cemented in part, moderately cemented in part.

920-925m Shale: 5%, as above.
Sandstone: 95%, as above, generally well cemented with silica, moderate to well sorted, fair porosity in part.

925-930m Shale: 10%, as above.
Sandstone: 90%, light grey, salt and pepper textured, fine to medium grained, in part coarse grained, moderate to well sorted, angular to subangular, well cemented with silica, tight to fair porosity.

930-935m Shale: 70%, dark grey, blocky, silty.
Sandstone: 30%, as above.

935-940m Shale: 50%, as above.
Sandstone: 50%, as above, generally well sorted, moderately cemented, good porosity in part.

940-945m Shale: 70%, dark grey, subfissile, blocky in part, silty.
Sandstone: 30%, white/clear, black, salt and pepper textured, medium grained, well sorted, moderately cemented with silica, good porosity in part.

945-950m Shale: 40%, as above.
Sandstone: 60%, as above.

950-955m Shale: Trace.
Sandstone: 100%, white/clear, black, salt and pepper textured, medium to coarse grained, well sorted, angular to subangular clasts, rounded clasts in part, moderate to well sorted, quartz overgrowths, fair to good porosity in part.

955-960m Shale: 20%, as above.
Sandstone: 80%, as above, medium to coarse grained.

960-965m Shale: 30%, as above.
Sandstone: 70%, as above, fine to medium grained.

965-970m Shale: 20%, as above.
Sandstone: 80%, as above, fine to medium grained.

970-975m Sandstone: 100%, as above, fine grained, common medium grained, moderate to well cemented with silica, tight to fair porosity, scattered coarse grained, rare glauconite (or green chert).

975-980m Sandstone: 100%, as above, becoming very fine to fine grained, well cemented and tight.

980-985m Sandstone: 100%, light grey, salt and pepper textured, very fine to fine grained, well sorted, angular clasts, well cemented with silica, tight to trace porosity in part.

985-990m Shale: 5%, as above, cavings?
Sandstone: 95%, as above.

990-995m Shale: 15%, grey to dark grey, fissile to blocky, silty in part, pyritic in part.
Sandstone: 85%, as above.
Coal: Trace.

995-1005m Shale: 15%, as above.
Sandstone: 85%, as above, becoming silty in part.

1005-1010m Shale: 25%, dark grey, black in part, subfissile to blocky, silty, sandy streaks in part.
Sandstone: 75%, as above.

1010-1015m Shale: 15%, as above.
Sandstone: 85%, light grey, salt and pepper textured, very fine to fine grained, silty, moderate sorting, well cemented and tight, pyritic in part, argillaceous in part.

1015-1020m Shale: 30%, as above.
Sandstone: 70%, as above, becoming very fine grained and silty, slightly argillaceous, tight.

1020-1025m Shale: 50%, grey to dark grey, blocky to subfissile, silty, sandy in part, pyritic.
Sandstone: 50%, as above, generally very fine grained and silty, argillaceous.

1025-1030m Shale: 80%, as above, sideritic, pyritic.
Sandstone: 20%, as above.

Trip for bit at 1031m.

1030-1035m Shale: 100%, dark grey, generally blocky, silty, very sandy in part, sandy streaks.

1035-1040m Shale: 80%, as above.
Sandstone: 20%, light grey, salt and pepper textured, very fine to fine grained, silty in part, moderate sorting, well cemented, tight to fair porosity in part, very fine grained and silty in part, trace mica flakes.

1040-1045m Shale: 30%, as above.
Sandstone: 70%, as above, scattered medium to coarse grained in part?

1045-1050m Shale: 20%, as above.
Sandstone: 80%, white/clear, black, salt and pepper textured, very fine to medium grained, in part coarse grained, moderate to well sorted, angular to subangular in part rounded clasts, poorly consolidated, good porosity?

1050-1055m Shale: 60%, grey to dark grey, blocky to subfissile, commonly silty, in part sandy.
Sandstone: 40%, as above. Also; grey, very fine to fine grained, silty and argillaceous, tight.

1055-1060m Shale: 90%, dark grey, blocky, silty, very sandy in part.
Sandstone: 10%, grey, very fine to fine grained, silty, argillaceous, poor sorting, tight.

1060-1065m Shale: 80%, as above, in part brown ,hard, sideritic.
Sandstone: 20%, as above, in part light grey, very fine to fine grained, moderately sorted, well cemented, tight.

1065-1070m Shale: 40%, as above, very silty, sandy in part, sideritic in part.
Sandstone: 60%, light grey to grey, very fine to fine grained, silty, poor to moderate sorting, argillaceous in part, well cemented and tight.

1070-1075m Shale: 10%, as above.
Sandstone: 90%, as above, moderately to well sorted in part, in part medium grained.

1075-1080m Shale: 70%, as above.
Sandstone: 30%, as above.

1080-1085m Shale: 95%, as above.
Sandstone: 5%, as above.

1085-1090m Shale: 85%, dark grey, blocky to subfissile, generally not silty, sandy in part.
Sandstone: 15%, light grey, salt and pepper textured, very fine to fine grained, silty in part, moderate sorting, angular clasts, well cemented and tight.

1090-1095m Shale: 30%, as above.
Sandstone: 70%, as above, common fine to medium grained (see below).

1095-1100m Shale: 90%, as above.
Sandstone: 10%, as above.

1100-1105m Shale: 70%, as above.
Sandstone: 30%, white/clear, black, salt and pepper textured, fine to medium grained, well sorted, angular to subangular, poorly consolidated, good porosity? Minor as above.

1105-1110m Shale: 40%, as above.
Sandstone: 60%, light grey, salt and pepper textured, moderate to well sorted, well cemented and tight. Also; white/clear, black, fine to medium grained, in part coarse grained, well sorted, angular to subangular and in part subrounded clasts, poorly consolidated? Trace to fair porosity in part.

1110-1115m Shale: 5%, as above.
Sandstone: 95%, light grey, salt and pepper textured, moderate to well sorted, well cemented and tight. Minor fine to medium grained, in part coarse grained.

1115-1125m Shale: 5%, grey to dark grey, blocky to subfissile, silty in part.
Sandstone: 95%, as above, rare glauconite in part?

1125-1130m Shale: 30%, common siderite.
Sandstone: 70%, as above, very fine to fine grained and silty.

1130-1135m Shale: 80%, grey, blocky, generally very sandy, common sandy laminations, (very fine to fine grained).
Sandstone: 20%, as above. Minor; white/clear, black, salt and pepper textured, fine to medium grained, well sorted, poorly consolidated? Porosity?

1135-1140m Shale: 5%, dark grey, blocky to subfissile, silty in part.
Sandstone: 95%, light grey, salt and pepper textured, very fine to fine grained, in part medium grained, well sorted, angular to subangular clasts, well cemented with silica, sideritic in part, slightly calcareous, tight, trace mica flakes.

1140-1145m Shale: Trace.
Sandstone: 100%, as above.

1145-1150m Sandstone: 100%, as above. Becoming light grey to grey, salt and pepper textured, very fine grained and silty, moderate to well sorted, tight.

1150-1155m Shale: 80%, grey, blocky, very silty, commonly sandy.
Sandstone: 20%, grey, salt and pepper textured, very fine grained and silty, argillaceous, poor to moderate sorting, well cemented and tight.

1155-1160m Shale: 70%, as above, generally very sandy.
Sandstone: 30%, as above.

1160-1165m Shale: 95%, grey to dark grey, blocky, silty, very sandy in part.
Sandstone: 5%, grey, salt and pepper textured, very fine grained and silty, argillaceous, well cemented and tight.

1165-1170m Shale: 100%, as above.

1170-1175m Shale: 100% dark grey, blocky to subfissile, silty, sandy in part.

1175-1180m Shale: 100%, dark grey to black, subfissile, micro-micaceous, flat luster, trace pyrite.

1180-1185m Shale: 5%, as above.
Sandstone: 95%, white/clear, black, salt and pepper textured, fine to coarse grained, very coarse grained in part, well sorted, angular to subrounded, well cemented with silica and calcite, fair to good porosity in part (?), sideritic in part, rare chert pebbles, common light green clasts.

1185-1200m Sandstone: 100%, as above, fine to coarse grained, in part very coarse grained, trace quartz overgrowths, fair to good porosity in part, trace pyritic matrix in part.

1200-1205m Sandstone: 100%, white/clear, black, salt and pepper textured, fine to medium grained, in part coarse grained, well sorted, moderate to well cemented with silica, trace quartz overgrowths, trace to fair porosity in part.

Slater River log top at 1213.5m.

1205-1215m Shale: 5%, dark grey, blocky, silty.
Sandstone: 95%, as above, cavings.

1215-1220m Shale: 70%, dark grey, blocky to subfissile, micro-micaceous, silty in part, sandy laminations in part.
Sandstone: 30%, light grey, salt and pepper textured, very fine grained and silty, argillaceous in part, well cemented and tight.

1220-1224m Shale: 80%, dark grey, subfissile to fissile, micro-micaceous, occasional silty/sandy streaks, mica flakes in part.
Sandstone: 20%, as above.

Trip for bit at 1224m.

1224-1240m Shale: 100%, dark grey, blocky to subfissile, micro-micaceous, silty in part, occasional sandy streaks.

1240-1250m Shale: 100%, as above, common sandy laminations.
Sandstone: Trace, light grey, salt and pepper textured, very fine to fine grained, silty, poor to moderate sorting, well cemented and tight.

1250-1255m Shale: 100%, dark grey, subfissile, micromicaceous, flat luster, common sandy laminations.

1255-1260m Shale: 90%, as above.
Sandstone: 10%, as above. Minor very fine grained and silty, well cemented and tight.

1260-1265m Shale: 80%, as above.
Sandstone: 20%, as above.

1265-1270m Shale: 60%, as above.
Sandstone: 40%, as above, in part moderate to well sorted, well cemented and tight, kaolinitic.

1270-1275m Shale: 5%, as above.
Sandstone: 95%, light grey, salt and pepper textured, very fine to fine grained, silty in part, moderate to well sorted, angular to subangular clasts, well cemented with silica, kaolinitic, trace porosity in part.

1275-1280m Shale: 20%, dark grey, subfissile, silty in part, micromicaceous, flat luster.
Sandstone: 80%, as above.

1280-1295m Shale: 10%, as above.
Sandstone: 90%, as above.

1295-1300m Shale: 10%, dark grey, blocky to subfissile, micromicaceous, silty in part.
Sandstone: 90%, light grey, salt and pepper textured, very fine to fine grained, silty in part, moderate to well sorted, angular to subangular clasts, moderate to well cemented with silica and kaolinite, trace porosity in part, becoming very fine grained and silty in part.

1300-1325m Shale: 30%, as above.
Sandstone: 70%, as above, locally abundant pyrite.

1325-1330m Shale: 70%, dark grey, fissile to subfissile, micromicaceous, silty in part.
Sandstone: 30%, light grey, salt and pepper textured, very fine to fine grained, silty, commonly very fine grained and silty, poor to moderate sorting, well cemented and tight, kaolinitic.

1330-1335m Shale: 50%, as above.
Sandstone: 50%, as above.

1335-1340m Shale: 70%, as above.
Sandstone: 30%, as above.

1340-1350m Shale: 80%, dark grey to black, subfissile to fissile, micromicaceous, silty in part.
Sandstone: 20%, as above.

1350-1370m Shale: 70%, as above.
Sandstone: 30%, as above.

1370-1375m Shale: 80%, dark grey, blocky to subfissile, micromicaceous, silty in part, flat luster in part.
Sandstone: 20%, as above.

1375-1380m Shale: 70%, as above.
Sandstone: 30%, light grey, very fine to fine grained, silty in part, moderate to well sorted, poor sorting in part, well cemented and tight.

1380-1385m Shale: 60%, as above, sideritic in part.
Sandstone: 40%, as above.

1385-1390m Shale: 80%, dark grey, blocky to subfissile, micromicaceous, flat luster.
Sandstone: 20%, as above.

1390-1405m Shale: 90%, as above.
Sandstone: 10%, becoming very fine grained and silty.

1405-1410m Shale: 80%, as above.
Sandstone: 20%, light grey, salt and pepper textured, very fine grained and silty, fine grained in part, moderate sorting, well cemented and tight.

1410-1414m Shale: 70%, as above.
Sandstone: 30%, as above.

Trip for bit at 1414m.

1414-1430m Shale: 70%, dark grey, blocky to subfissile, micromicaceous, silty in part.
Sandstone: 30%, as above.

1430-1435m Shale: 80%, as above, sideritic in part.
Sandstone: 20%, as above, mostly very fine grained and silty, sideritic in part, tight.

1435-1440m Shale: 95%, as above, sideritic in part.
Sandstone: 5%, as above.

1440-1450m Shale: 100%, dark grey to black, blocky to subfissile, micromicaceous, commonly sideritic.

Radioactive Shale log top at 1454.0m.

1450-1455m Shale: 100%, black, subfissile to blocky, fossiliferous in part.

1455-1460m Shale: 100%, as above, trace fossiliferous, trace calcite veining.

1460-1465m Shale: 100%, black to dark brown/black, blocky to subfissile, flat earthy luster, rare silty streaks, trace fossiliferous, calcareous in part, white specks in part.

1465-1480m Shale: 100%, black, subfissile to blocky, flat earthy luster, no fossils.

1480-1485m Shale: 100%, as above, trace fossiliferous, trace calcareous, trace Inoceramus.

1485-1495m Shale: 100%, black to brown/black, subfissile to blocky, flat earthy luster, fossiliferous in part, slightly calcareous, rare sandy streak.

1495-1510m Shale: 100%, black to brown/black, blocky, flat luster, slightly calcareous in part, silty in part, trace sandy, trace fossiliferous, trace dolomite rhombs in shale matrix.

1510-1515m Shale: 100%, as above, becoming flat luster in part, not dolomitic or sandy.

1515-1520m Shale: 95%, as above.
Sandstone: 5%, grey/brown, salt and pepper textured, very fine to fine grained, silty, poor to moderate sorting, well cemented and tight.

1520-1525m Shale: 90%, as above.
Sandstone; 10%, as above.

Devonian Imperial log top at 1525.0m.

1525-1530m Shale: 70%, black to brown/black, blocky to subfissile, flat luster in part, silty/sandy in part.
Sandstone: 30%, grey/brown, salt and pepper textured, very fine to fine grained, silty, poor to moderate sorting, well cemented, argillaceous in part, tight. Minor fine grained, salt and pepper textured, well sorted, angular to subangular clasts, well cemented, tight.

1530-1535m Shale: 70%, as above, trace light grey to light grey/brown, waxy luster, silty.
Siltstone: 10%, light grey, commonly very fine to fine sandy, poor to moderate sorting, kaolinitic, tight, trace glauconite, grading to sandstone in part.
Sandstone: 20%, light grey, very fine grained and silty, poor to moderate sorting, slightly argillaceous, kaolinitic, trace glauconitic, tight. Also; as above.

1535-1540m Shale: 60%, predominantly dark cavings. Minor; grey, subfissile to blocky.
Siltstone: 40%, light grey, commonly very fine to fine sandy, poor to moderate sorting, kaolinitic, tight, trace pyrite, grading to sandstone in part.

1540-1545m Shale: 70%, mostly dark cavings. Minor; light grey, blocky, pyritic in part.
Siltstone: 30%, as above.

1545-1555m Shale: 20%, as above.
Siltstone: 80%, light grey, very fine sandy in part, argillaceous/kaolinitic, tight, slightly calcareous in part, trace mica flakes.

1555-1565m Shale: 30%, as above.
Siltstone: 70%, as above.

1565-1575m Shale: 40%, as above.
Siltstone:50%, as above, abundant dolomitized fossil debris in part, crinoids and brachiopods, locally sandy adjacent fossil debris.
Sandstone: 10%, white/clear, black, salt and pepper textured, fine to medium grained, well sorted, angular to subangular clasts, well cemented with silica and dolomite, fossil debris in part.

1575-1580m Shale: 5%, as above, mostly cavings.
Siltstone: 95%, as above, abundant dolomitized fossil debris, crinoids, tight.

1580-1585m Shale: 25%, as above.
Siltstone: 75%, as above, common fossil debris, tight.

1585-1590m Shale: 30%, dark cavings.
Siltstone: 70%, as above, trace dolomitic fossil debris, brachiopods and crinoids.

1590-1595m Shale: 70%, as above, cavings.
Siltstone: 30%, as above.

Wiper trip at 1595m.

1595-1600m Shale: 20%, cavings.
Sandstone: 80%, as above, trace crinoids.

1600-1605m Shale: 10%, cavings.
Siltstone: 90%, light grey to grey, trace very fine to fine sandy in part, kaolinitic, tight, trace pyrite, no fossils, calcareous in part.

1605-1610m Shale: 5%, dark cavings.
Siltstone: 95%, as above.

1610-1640m Siltstone: 100%, light grey to grey, very fine sandy in part, kaolinitic, locally argillaceous, pyritic in part, mica flakes, trace calcite veining in part, slightly calcareous in part. Rare fossil debris in part.

1640-1645m Shale: 5%, grey, subfissile to blocky, micromicaceous, silty.
Siltstone: 95%, as above, rare fossil debris.

1645-1650m Shale: 10%, as above.
Siltstone: 90%, as above.

1650-1655m Shale: 30%, as above.
Siltstone: 70%, as above, common shale partings.

1655-1660m Shale: 40%, as above.
Siltstone: 60%, light grey to grey, very fine sandy in part, slightly argillaceous, kaolinitic, mica flakes, rare fossil.

1660-1680m Shale: 70%, grey, blocky, silty, micromicaceous.
Siltstone: 30%, as above, no fossils.

1680-1685m Shale: 40%, grey, blocky, silty, micromicaceous in part.
Siltstone: 60%, as above, trace pyritic.

1685-1695m Shale: 30%, as above.
Siltstone: 70%, as above.

1695-1700m Shale: 50%, as above, common dark cavings.
Siltstone: 50%, as above, common dolomitic fossil debris.

1700-1715m Shale: 70%, as above, abundant cavings.
Siltstone: 30%, as above, shale partings in part.

1715-1720m Shale: 30%, as above, abundant dark cavings also.
Siltstone: 70%, light grey, very fine sandy in part, slightly argillaceous in part, argillaceous partings in part, kaolinitic, tight, mica flakes.

1720-1721m Shale: 80%, dark grey, fissile to subfissile, rare micro-micaceous in part, flat luster.
Siltstone: 20%, as above.
Sandstone: Trace, off white, quartzitic, very fine to medium grained, moderate to well sorted, well cemented with silica and dolomite, tight.

1721-1725m Shale: 90%, as above.
Siltstone: 10%, as above.

Radioactive Shale log top at 1727.5m.

1725-1730m Shale: 50%, as above.
Siltstone: 50%, as above.

1730-1735m Shale: 50%, as above.
Sandstone: 50%, light grey to grey, common very fine to fine sandy, kaolinitic, argillaceous in part, well cemented and tight, dolomitic in part, grading to sandstone in part.
Sandstone: Trace, white to light grey, silt to fine grained, moderate sorting, angular clasts, well cemented and tight, dolomitic.

1735-1740m Shale: 30%, as above.
Siltstone: 60%, as above.
Sandstone: 10%, as above.

1740-1745m Shale: 40%, dark grey, subfissile to fissile, trace silty in part, flat luster, micromicaceous in part.
Siltstone: 30%, as above, grading to sandstone in part, dolomitic in part.
Sandstone: 30%, as above.

1745-1760m Shale: 20%, as above.
Siltstone: 70%, as above.
Sandstone: 10%, as above.

1760-1765m Shale: 10%, as above.
Siltstone: 90%, light grey, commonly very fine sandy, well cemented, kaolinitic, tight, dolomitic, trace dolomitized fossil debris, crinoidal.

1765-1775m Shale: Trace.
Sandstone: 100%, off white, quartzitic, very fine to fine grained, silty, poor to moderate sorting, moderately cemented with silica and dolomite, trace porosity in part, mica flakes.

1775-1780m Shale: 10%, dark grey, blocky to subfissile, silty.
Sandstone: 90%, as above.

1780-1785m Shale: 30%, as above.
Sandstone: 70%, as above, becoming light grey, very fine grained and silty, poor to moderate sorting, well cemented with silica and dolomite, tight, in part grading to sandy siltstone.

1785-1790m Shale: 90%, dark grey, fissile, rare micromicaceous, rare silty, flat luster.
Sandstone: 10%, as above.

1790-1795m Shale: 100%, as above.

1795-1810m Shale: 100%, dark grey/black, subfissile to fissile, trace micromicaceous, trace pyritic in part, slightly dolomitic in part.

1810-1820m Shale: 100%, dark brown/black, subfissile to blocky, trace pyritic, slightly dolomitic in part, trace silty in part.

1820-1870m Shale: 100%, grey to dark grey, subfissile to fissile, waxy luster, silty, pyritic in part.

Hare Indian Shale log top at 1871.0m.

1870-1890m Shale: 100%, dark grey to dark brown/black, subfissile to blocky, flat earthy luster, trace pyritic, trace calcite veining in part, slightly calcareous in part.

1890-1910m Shale: 100%, black to dark brown/black, subfissile to blocky, trace micromicaceous in part, rare pyrite, trace calcite veining, trace coarse crystalline calcite fracture fill.

1910-1920m Shale: 100%, as above, trace calcite veining.

1920-1935m Shale: 100%, dark brown/black, subfissile to blocky, micromicaceous in part, common to abundant calcite veining, locally slickensided, trace coarse crystalline calcite fracture fill.

1935-1950m Shale: 100%, dark brown/black, subfissile to blocky, micromicaceous in part, common calcite veining.

1950-1955m Shale: 100%, as above, becoming dark grey/black, trace pyrite, trace calcite veining.

1955-1960m Shale: 100%, as above, common calcite veining, locally silty in part, white specks in part.

1960-1970m Shale: 100%, as above, common calcite veining, abundant pyrite.

1970-1983m Shale: 100%, dark grey/black, subfissile to fissile, micromicaceous in part, flat luster, trace pyrite in part, trace silty streaks.

Trip for bit at 1983m.

1983-1985m Shale: 100%, dark grey to black, fissile to subfissile, flat luster.

Bluefish log top at 1987.0m.

1985-1990m Shale: 100%, dark grey to black, fissile to subfissile, abundant calcite veining, locally very calcareous, white specks in part.

1990-1995m Shale: 100%, dark brown/black, subfissile to blocky, flat luster, commonly very calcareous, common calcite veining.

1995-2000m Shale: 100%, as above, trace calcite veining with pyrobitumen fill in part, trace "egg shaped" fossils, abundant white specks in part.

2000-2005m Shale: 100%, as above, very calcareous in part, white specks in part, trace fossiliferous, common calcite veining.

Hume log top at 2006.0m.

2005-2007m Shale: 100%, as above.
Limestone: Trace, off white to light brown, medium to coarse bioclastic, grainstone or packstone, dense, trace Amphipora Sp. seen.

2007-2010m Limestone: 100%, off white to light brown, micro-crystalline to very fine crystalline matrix, type II/I, coarse bioclastic fragments, dense, wackestone to packstone, brachiopods, crinoids, no show.

2010-2015m Limestone: 100%, as above, trace cherty in part, wackestone to packstone, dense, possible calcite veining, styolitic.

2015-2020m Limestone: 100%, as above, generally light brown, cryptocrystalline to microcrystalline, type I-II/I, no visable porosity, wackestone to mudstone, non dolomitic, non cherty, rare calcite fracture lining with pyrobitumen.

2020-2025m Limestone: 100%, as above, rare calcite veining with pyrobitumen fill, rare streak of bioclastic grainstone with patchy I/III intercrystalline porosity with pyrobitumen fill, no effective porosity, no show.

2025-2030m Limestone: 100%, Off white to light brown, crypto-crystalline to microcrystalline, scattered bioclasts, mudstone to wackestone. Rare grainstone, type I/III, 6% intercrystalline porosity filled with pyrobitumen, no effective porosity.

2030-2035m Limestone: 100%, as above, no porosity or show, common very coarse crystalline calcite fracture fill, mudstone to wackestone, dense.

2035-2040m Limestone: 100%, as above, generally type I/III, mudstone, dense, common calcite veins. Trace grainstone with 6% intercrystalline porosity with pyrobitumen fill.

2040-2045m Limestone: 100%, off white to light brown, cryptocrystalline to microcrystalline, type II/I-I, no visable porosity, mudstone to wackestone, fossiliferous, crinoids and brachiopods.

2045-2048m Limestone: 100%, as above. Trace of fine to medium crystalline calcite fracture lining with 6-10% porosity containing dead oil specks, faint fluorescence and a quick streaming cut fluorescence, poor live oil show.

2048-2050m Limestone: 100%, off white to light brown, cryptocrystalline to microcrystalline, type II/I, no visable porosity, wackestone to packstone, non dolomitic.

2050-2055m Limestone: 100%, as above, mostly packstone, disseminated pyrite in part, minor dark brown, cryptocrystalline, type I, dense, slightly argillaceous, silty, mudstone, grading to grainstone in part.

Trip for bit at 2055m.

Headless log top at 2059m.

2055-2060m Shale: 60%, trip cavings.
Limestone: 40%, off white, minor light grey, microcrystalline, type II/I, ostracod mudstone, no visable porosity, commonly silty, slightly argillaceous.

2060-2065m Shale: 10%, trip cavings.
Limestone: 90%, as above, rare ostracod, mudstone, no visable porosity.

2065-2070m Shale: 50%, as above.
Limestone: 50%, as above, commonly silty, slightly argillaceous in part, minor type I, ostracod mudstone.

2070-2075m Shale: 40%, cavings.
Limestone: 60%, as above, locally moderate silty and argillaceous, dense.

2075-2080m Shale: 30%, as above, predominantly cavings, minor light grey, blocky, very silty.
Limestone: 70%, off white to light grey, light grey/brown, cryptocrystalline to microcrystalline, type II/I-I, mudstone, fossiliferous in part, crinoids and brachiopods, slight to moderately silty, argillaceous in part, local sandy streaks.

2080-2085m Shale: 20%, cavings.
Limestone: 80%, off white to light brown, micro-crystalline to cryptocrystalline, type II/I, minor type I, mudstone, no visable porosity, crinoidal, minor packstone.

2085-2095m Shale: 30%, cavings.
Limestone: 70%, as above, ostracod mudstone, crinoidal, no visable porosity, rare grainstone streak, trace pyrite in part, calcite veining in part.

2095-2100m Shale: 10%, dark brown, blocky, very calcareous, grading to limestone.
Limestone: 90%, off white to light brown to light grey/brown, cryptocrystalline to microcrystalline, type II/I, mudstone, no visable porosity, trace calcite veining, locally very argillaceous, silty in part, grading to shale in part.

2100-2105m Shale: 5%, as above.
Limestone: 95%, as above, locally very silty.

2105-2115m Shale: 20%, as above.
Limestone: 80%, as above.

2115-2120m Shale: 10%, as above.
Limestone: 90%, off white to light brown to light grey/brown, cryptocrystalline to microcrystalline, type II/I, type I in part, mudstone, locally very silty, slightly argillaceous in part, minor packstone, crinoidal.

2120-2125m Shale: 20%, as above.
Limestone: 80%, as above, trace pyrite, rare anhydrite, crinoids and brachiopods, mudstone, minor packstone.

2125-2130m Shale: 40%, predominantly cavings, minor light grey, subfissile, waxy luster, silty, slightly calcareous.
Limestone: 60%, as above, ostracod mudstone, commonly very silty, no visable porosity, argillaceous in part, brachiopods.

2130-2135m Shale: 10%, as above.
Limestone: 90%, off white to light brown to light grey/brown, microcrystalline to cryptocrystalline, type II/I-I, mudstone, no visable porosity, minor packstone, ostracods, brachiopods.

2135-2140m Shale: 30%, as above.
Limestone: 70%, as above, commonly very silty, grading to siltstone in part.

Landry log top at 2143.0m.

2140-2145m Shale: 20%, as above, mostly cavings.
Limestone: 80%, light grey to light grey/brown, microcrystalline, type II/I, mudstone, scattered fossils, generally silty to very silty, slightly argillaceous in part.

2145-2148m Limestone: 100%, as above, ostracod brachiopod mudstone, rare grainstone with trace porosity with dead oil specks, no effective porosity.

2148-2150m Limestone: 100%, as above, rare porosity with dead oil as above.

2150-2155m Limestone: 100%, off white to light brown crypto-crystalline to microcrystalline, type II/I, mudstone, minor packstone, ostracods, brachiopods, pelletal in part, commonly light grey and very silty.

2155-2160m Limestone: 100%, as above, common dark brown, type I, very argillaceous grading to shale in part, rare calcite veining.

2160-2165m Shale: 10%, dark brown, blocky, very calcareous.
Limestone: 90%, off white to light grey/brown, light grey, cryptocrystalline to microcrystalline, commonly very silty, type II/I, mudstone, fossiliferous in part, pelletal in part? Trace very argillaceous in part.

2165-2170m Shale: 30%, as above, trace calcite veining.
Limestone: 70%, as above.

2170-2180m Shale: 50%, as above, brown to dark brown.
Limestone: 50%, as above, generally very silty, slightly argillaceous, rare pellets, mudstone, no visable porosity. Abundant calcite veining.

Arnica log top at 2183.0m.

2180-2185m Limestone: 10%, as above, pelletal in part.
Dolomite: 90%, light brown, microcrystalline to very fine crystalline, trace fine crystalline, type I/III-III/I, 6-8% intercrystalline and pinpoint porosity, trace pyrobitumen in part, mudstone, crinoidal.

2185-2190m Dolomite: 100%, light brown, microcrystalline to very fine crystalline, type I-I/III, rare 6% intercrystalline porosity in part, generally tight, slightly calcareous. Common calcite veining.

2190-2195m Dolomite: 100%, as above, 6-8% intercrystalline porosity in part, rare pyrobitumen slightly calcareous, trace anhydritic, common calcite veining, common coarse crystalline calcite fracture fill.

2195-2200m Dolomite: 100%, as above, becoming moderately calcareous in part, microcrystalline to fine crystalline, type I, no visable porosity, in part type I/III, common calcite veining.

2200-2205m Dolomite: 100%, light brown to grey/brown, predominantly type I, cryptocrystalline to fine crystalline, mudstone, no visable porosity.

2205-2210m Limestone: 10%, off white, cryptocrystalline, type I, dense, mudstone.
Dolomite: 90%, light brown, mottled, cryptocrystalline to microcrystalline, type I-I/III, minor microcrystalline to very fine crystalline, 6-8% intercrystalline porosity in part, common dead oil staining on fractures, commonly very calcareous, calcite veining in part, bioclastic textured in part.

2210-2215m Limestone: 60%, off white to light brown, cryptocrystalline, type II/I-I, dense, mudstone.
Dolomite: 40%, as above, in part microcrystalline to very fine crystalline, type I/III, 6% intercrystalline porosity with trace pyrobitumen.

2215-2220m Limestone: 70%,as above.
Dolomite: 30%, light brown to grey/brown, microcrystalline to very fine to fine crystalline, type I-I/III, in part III/I, 6-10% intercrystalline porosity an pinpoint porosity without pyrobitumen, no fluorescence or cut fluorescence.

2220-2225m Limestone: 70%, off white to light brown, cryptocrystalline to microcrystalline, type II/I, mudstone, dense, common coarse crystalline euhedral calcite crystals with rare pyrobitumen.
Dolomite: 30%, light grey/brown, microcrystalline to very fine crystalline, type I/II-I, mudstone (?), pelletal in part, very calcareous in part, rare intercrystalline porosity with pyrobitumen fill.

2225-2230m Limestone: 80%, as above, common coarse crystalline euhedral calcite crystals fracture lining.
Dolomite: 20%, as above, local very fine crystalline type III/I, 8% intercrystalline porosity, trace anhydritic.

2230-2235m Limestone: 70%, as above, trace coarse euhedral calcite void lining.
Dolomite: 30%, light brown, microcrystalline to very fine crystalline, type I-I/III, mottled textured, very calcareous in part, bioclastic packstone, tight to 6% intercrystalline porosity with pyrobitumen fill in part.

2235-2240m Limestone: 40%, as above.
Dolomite: 60%, as above, trace microcrystalline with 4-6% intercrystalline porosity without pyrobitumen, trace anhydrite.

2240-2245m Limestone: 30%, as above.
Dolomite: 70%, light brown, microcrystalline to very fine crystalline, type I, minor type I/III, 4-6% intercrystalline porosity in part, pyrobitumen fill in part, generally calcareous, common calcite veining.

2245-2250m Limestone: Trace.
Dolomite: 100%, light grey/brown, minor brown, micro-crystalline to fine crystalline, type I-I/III, trace III/I, 6-8% intercrystalline porosity in very fine to fine crystalline, trace pyrobitumen, minor pinpoint porosity, common calcite veining, common very coarse crystalline calcite fracture lining.

White Dolomite log top at 2254.0m.

2250-2255m Dolomite: 100%, light brown to light grey/brown, cryptocrystalline to microcrystalline, type I, mudstone, minor packstone, generally very calcareous, no visable porosity.

2255-2265m Dolomite: 100%, off white to very light grey/brown, cryptocrystalline to microcrystalline, type I, generally calcareous, no visable porosity, calcite filled micro-fractures, mudstone, ghost ostracods.

2265-2270m Dolomite: 100%, as above, commonly very calcareous, mudstone.

Trip for bit and laydown MWD tools.

2270-2275m Shale: 90%, trip cavings.
Dolomite: 10%, off white to very light grey/brown, cryptocrystalline to microcrystalline, type I-I/II, no visable porosity, mudstone, slightly calcareous in part, slightly silty.

2275-2280m Shale: 10%, cavings.
Dolomite: 50%, as above.
Limestone: 40%, off white, cryptocrystalline to microcrystalline, type II/I-I, dense, mudstone, rare ostracod, very abundant coarse euhedral calcite fracture lining, trace anhydrite.

2280-2285m Shale: Trace.
Dolomite: 95%, white to off white, light brown to brown, cryptocrystalline to microcrystalline, in part fine to coarse crystalline, mudstone, common coarse bioclastic grainstone, calcareous in part, trace coarse crystalline calcite void lining, trace of 6-8% intercrystalline porosity with pyrobitumen fill, possible vuggy porosity.
Limestone: 5%, as above.

2285-2290m Dolomite: 100%, off white to light brown, micro-crystalline to very fine crystalline, type I, no visable porosity, mudstone, trace light grey and silty, trace anhydrite, trace coarse crystalline calcite fracture lining.

2290-2295m Siltstone: Trace, light grey, blocky, silty, slightly argillaceous, trace pyritic, dolomitic, tight.
Dolomite: 100%, off white to light brown, micro-crystalline, type I, minor type I/II, no visable porosity, mudstone, calcareous in part.
Limestone: Trace, cryptocrystalline, dense, mudstone.

2295-2300m Siltstone: 40%, as above.
Dolomite: 60%, as above, cherty in part, mudstone textured with sparse fossils.

2300-2305m Siltstone: 20%, as above.
Dolomite: 60%, off white to light brown, microcrystalline to very fine crystalline, type I, trace type I/III with 4% intercrystalline porosity, mudstone.
Chert: 20%, white to off white, light grey and light brown, mottled, grainstone textured, possible pelletal.

2305-2310m Dolomite: 100%, as above, very cherty, silty in part, type I, dense, mudstone.

2310-2315m Dolomite: 100%, as above, becoming fine to very coarse crystalline, type I, no visable porosity, grainstone, cherty in part, silty in part.

2315-2320m Dolomite: 100%, off white to white, mottled in part, microcrystalline to very fine crystalline, fine to very coarse crystalline, mudstone and grainstone, type I, no visable porosity, locally light grey and silty.

2320-2325m Dolomite: 100%, as above, mudstone and grainstone, type I, no visable porosity, anhydritic in part, trace silty streaks.

2325-2330m Siltstone: 5%, light grey to grey, hard, dolomitic, locally moderately argillaceous, locally grading to shale in part.
Dolomite: 95%, off white to light brown, microcrystalline to very fine crystalline, in part fine crystalline, mudstone, minor grainstone, no visable porosity, trace coarse crystalline calcite void fill.

2330-2235m Shale: Trace, grey, grey/green, subfissile, silty.
Siltstone: Trace, as above, locally very argillaceous.
Dolomite: 100%, as above.

2335-2340m Shale: Trace, light grey to light grey/green, subfissile, waxy luster in part.
Dolomite: 100%, white to off white, mottled, medium to very coarse crystalline, grainstone, type I, no visable porosity, minor mudstone, trace silty in part, local sandy streaks.

2340-2342m Siltstone: Trace as above.
Dolomite: 100%, as above, mostly bioclastic grainstone.

Trip for bit at 2342m. Bit scrubbed.

2342-2345 Siltstone: 50%, light grey, hard, dolomitic, slightly argillaceous.
Dolomite: 50%, off white to light grey/brown, micro-crystalline to fine crystalline, type I, no visable porosity, generally very silty/sandy, mudstone, generally very silty/sandy, mudstone, grading to siltstone in part.

2345-2350m Shale: Trace, light green/grey, light grey, subfissile, silty, grading to siltstone in part.
Dolomite: 100%, white to off white, microcrystalline to fine crystalline, type I/III-I, no visable porosity, mudstone(?), rare glauconite grains, common very silty/sandy.

2350-2355m Siltstone: Trace, as above.
Dolomite: 100%, as above, trace disseminated pyrite in part, commonly very silty/sandy.

2355-2360m Siltstone: Trace, as above.
Shale: Trace, as above.
Dolomite: 100%, as above, very rare glauconite grains, rare pyrite, trace intercrystalline porosity in part, generally very silty/sandy.

2360-2365m Dolomite: 100%, off white to white, microcrystalline to fine crystalline, type I/III-I, no visable porosity, trace disseminated pyrite, mudstone (?), possible grainstone in part, locally very silty, trace coarse crystalline calcite void lining.

2365-2368m Dolomite: 100%, as above, locally medium to coarse crystalline, type I/III-III/I, bioclastic grainstone.

2368-2375m Dolomite: 100%, as above, microcrystalline to fine crystalline, type I/III-I, no visable porosity, mudstone, disseminated pyrite in part.

Pink Dolomite log top at 2378.0m.

2375-2380m Siltstone: Trace, light grey to grey, dolomitic, tight.
Dolomite: 100%, off white to white, very fine to fine crystalline, minor microcrystalline, type I/III-I, trace intercrystalline porosity to 6-8% in part, mudstone, trace silty streaks, disseminated pyrite in part, trace slightly silty and sandy.

2380-2385 Siltstone: 5%, light grey, hard, dolomitic, slightly argillaceous.
Dolomite: 95%, as above, minor reddish mottled cast (Iron staining)generally slightly silty, common siltstone streaks.

2385-2390m Shale: 5%, light grey to light green/grey, subfissile, silty, dolomitic.
Dolomite: 95%,white to off white, very fine to fine crystalline, in part microcrystalline, type I/III-I no visable porosity, mudstone (?), trace reddish cast in part - Iron staining, rare red mottled chert? slightly silty/sandy, trace euhedral coarse crystalline calcite void lining.

2390-2395m Siltstone: Trace, as above.
Dolomite: 100%, as above, pinkish cast in part - Iron staining, generally slightly silty, trace coarse crystalline calcite void lining, trace bright green shaley patches (glauconite?).

2395-2400m Shale: Trace, light green/grey, pale green, silty, subfissile.
Siltstone: 5%, as above.
Dolomite: 95%, off white to white, pinkish cast in part, very fine to fine crystalline, in part microcrystalline, type I/IIII, no visable porosity, slightly silty.

FTD: 2400m Reached at 2215hrs 19-JAN-00.

Appendix "A"

Drill Stem Test results attached.

DELTA-P TEST CORP.

WELL TESTING AND EVALUATIONS

PO BOX 48157
40 MIDLAKE BLVD.,
CALGARY , ALBERTA T2X 3C9

Northrock et al East MacKay

64-46-41.610 / 125-43-10.277
Arnica 2175-2204
DST # 1

Fri, Jan 21, 2000

Northrock et al East MacKay
64-46-41.610 / 125-43-10.277
Arnica 2175-2204
DST # 1

PRETEST CALCULATIONS

FILENAME	N2361.DST
GAS GRAVITY	.65
FORMATION DEPTH	2190.00 MKB
FORMATION PRESSURE	22294.20 KPAg
FORMATION TEMPERATURE	68.31 DEG C
AVE CHAMBER TEMP	36.41 DEG C
INITIAL CHM SURFACE PRESSURE	90.00 KPAa
INITIAL GAS/N2 HEAD PRESSURE	105.35 KPAa
INITIAL TOTAL CUSH. PRESSURE	105.35 KPAa
INITIAL CUSHION LENGTH	.00 m
LIQUID CUSHION GRADIENT	.00 kPA/m
DOWN HOLE CHOKE DIAMETER	12.70 mm
CHOKE COEFFICIENT	18.02 m3/D/KPA
DRILL COLLAR LENGTH	56.11 m
DRILL COLLAR I.D.	74.00 mm
DRILL COLLAR CAPACITY	.004301 m3/m
DRILL COLLAR VOLUME	.241 m3
LOWER DRILL PIPE LENGTH	2105.53 m
LOWER DRILL PIPE I.D.	91.00 mm
LOWER DRILL PIPE CAPACITY	.006504 m3/m
LOWER DRILL PIPE VOLUME	13.694 m3
UPPER DRILL PIPE LENGTH	.00 m
UPPER DRILL PIPE I.D.	.00 mm
UPPER DRILL PIPE CAPACITY	.000000 m3/m
UPPER DRILL PIPE VOLUME	.000 m3
TOTAL CHAMBER VOLUME	13.94 m3
LIQUID CUSHION VOLUME	.00 m3
NET CHAMBER VOLUME	13.94 m3

	MAX. RATE	MAX. SURFACE DP/DT
GAS	497116.1 m3/D	2484.6 KPA/min
GAS SATURATED H2O	1137.4 m3/D	24.5 KPA/min
PURE LIQUID INFLUX	1137.4 m3/D	5.5 KPA/min

	INITIAL CONVERSION FACTORS
GAS	200.1 m3/D/KPA/min
GAS SATURATED H2O	46.4 m3/D/KPA/min
PURE LIQUID INFLUX	205.9 m3/D/KPA/min

Fri, Jan 21, 2000

Northrock et al East MacKay
64-46-41.610 / 125-43-10.277
Arnica 2175-2204
DST # 1

CLOSED CHAMBER REPORT SUMMARY

FLOW TIMES (minutes)

FLOW # 1 = 4 SHUT IN # 1 = n/a

FLOW RATES (m3/D)

		GAS	LIQUID
FLOW # 1	initial	0	390
	final	0	390

RECOVERY

LENGTH (m)	VOLUME (m3)	DESCRIPTION
40	0.260	DRILLING MUD
74	0.481	MUD CUT SALT WATER (66000 ppm NaCl)
56	0.159	SALT WATER (80000 ppm NaCl)
170	0.900	TOTAL RECOVERY

COMMENTS

Surface pressures and gas flow rates have been recorded on a minute by minute basis throughout three flow periods and the results, in tabular and graphical form, are contained in the following pages. In summary, salt water (80000 ppm NaCl or 48000 mg/L Chlorides) with no sign of hydrocarbon was produce following the initial preflow mud surge. Please note that the packer seat was lost 4 minutes into the preflow and the test was terminated after two attempts were made to re-inflate the packers.

Analysis for liquid production during this test was undertaken ultilizing pressure readings from the gauge above the shut-in tool (#70359) in conjunction with the reported recovery. Calculations indicate a recovery gradient of 11.94 kPa/m which is reasonable for muddy salt water and the reported recovery is verified. The liquid rate stabilized at 390 m3/D before the pack seat failed.

Baker Testers' test tool was inflate straddle. Gauges #70359 (fluid recovery @2162m) and #70360 (outside recorder @2178m) have been converted and included in this report.

PRESSURES kPa(g) outside @2177 meters

IH 24234
IPF 10315
FPF 7818
ISI n/a
FH 24117 BHT 71.3 degrees Celcius.

LIQUID AND GAS FLOW RATES

DELTA P TEST CORP. 520,400 - 5th Avenue S.W. CALGARY, ALTA. T2P 0L6

Northrock et al East MacKay
64-46-41.610 / 125-43-10.277
Fri, Jan 21, 2000
Arnica 2175-2204
DST # 1

Testtime (24 Hr.)	Flowtime (min)	Surface Dp/Dt (KPa/mn)	Surface Pressure (KPabs)	Recovery Dp/Dt (KPa/mn)	Recovery Pressure (KPabs)	Liquidrate (m3/D)	Gasrate (m3/D)
START OF FLOW #1							
07:50:00	0.00	0.00	99.17	0.0	125.3		
07:50:15	0.25	0.23	99.23	502.7	251.0	170.5	0.0
07:50:30	0.50	0.88	99.44	502.7	376.6	170.4	3.8
07:50:45	0.75	1.83	99.90	502.7	502.3	170.0	201.2
07:51:00	1.00	1.91	100.38	502.7	628.0	169.9	216.1
07:51:30	1.50	2.10	101.43	502.7	879.3	239.5	177.2
07:52:00	2.00	1.97	102.41	502.7	1130.7	390.8	0.0
07:52:30	2.50	2.10	103.46	502.7	1382.0	390.7	0.0
07:53:00	3.00	2.27	104.60	502.7	1633.4	390.6	25.7
07:53:30	3.50	2.29	105.74	502.7	1884.7	390.5	20.4
07:54:00	4.00	0.15	105.82	502.7	2136.1	392.5	0.0
START OF SHUT IN #1						(Apparent Rates)	
07:54:00	0.00	0.00	105.82	0.0	2136.1		
07:55:00	1.00	-0.01	105.81	-4.4	2131.7	0.0	1.9
07:56:00	2.00	-0.02	105.79	883.5	3015.1	690.0	0.0
07:57:00	3.00	0.00	105.79	-776.7	2238.4	0.0	676.6
07:58:00	4.00	0.00	105.79	-106.1	2132.3	0.0	92.3
07:59:00	5.00	0.00	105.79	-9.2	2123.1	0.0	8.0
08:09:00	15.00	0.00	105.80	2.8	2151.3	2.2	0.0
08:19:00	25.00	0.01	105.86	0.1	2152.4	0.1	1.0
08:29:00	35.00	0.00	105.86	0.0	2152.8	0.0	0.0
08:39:00	45.00	0.00	105.89	-0.0	2152.4	0.0	0.6
08:44:00	50.00	-1.37	99.04	-1.9	2142.9	0.0	0.0

END OF RECORDED SURFACE PRESSURE DATA

Baker Oil Tools — FIELD REPORT

TEST DATA

TEST No 1 LUS. TEST No 1
FORMATION TESTED ARNICA T.D. 2400.00 m
INTERVAL TESTED: From 2175.00 m to 2204.00 m
TOTAL INTERVAL TESTED 29.00 m
TEST TYPE INFLATE STRADDLE RESET: YES ☐ NO ☒
CUSHION: YES ☐ NO ☒ TYPE AMOUNT m
STARTED IN HOLE @ 23:00 HRS. OPENED TOOL 07:50 HRS.
DATE & TIME OUT OF HOLE 2000-01-22 @ 14:30 HRS.
TEST TIMES:
PRE-FLOW 4 MIN. INITIAL SHUT-IN MIN.
SECOND FLOW MIN. SECOND SHUT-IN MIN.
FINAL FLOW MIN. FINAL SHUT-IN MIN.
PRE-FLOW BLOW DESCRIPTION: CLOSED CHAMBER WITH DELTA-P. NO SEAT WHEN TIME TO SHUT-IN TOOL. PUMPED FOR 20 MIN, NO SEAT MOVED UP 1 METER PUMPED 20 MIN, NO SEAT. P.O.O.H.
FINAL FLOW BLOW DESCRIPTION:

MECHANICAL RECORDERS

No.	INSIDE ☐ OUTSIDE ☒	No.	INSIDE ☐ OUTSIDE ☐	No.	INSIDE ☐ OUTSIDE ☐
21099					
DEPTH	2178.00 m	DEPTH	m	DEPTH	m
CLOCK	16223	CLOCK		CLOCK	
REC. SEC. #	11673	REC. SEC. #		REC. SEC. #	
No.	INSIDE ☐ OUTSIDE ☐	No.	INSIDE ☐ OUTSIDE ☐	No.	INSIDE ☐ OUTSIDE ☐
DEPTH	m	DEPTH	m	DEPTH	m
CLOCK		CLOCK		CLOCK	
REC. SEC. #		REC. SEC. #		REC. SEC. #	

ELECTRONIC RECORDERS

No.	INSIDE ☐ OUTSIDE ☒	No.	INSIDE ☒ OUTSIDE ☐	No.	INSIDE ☒ OUTSIDE ☐
70360		70014		70359	
DEPTH	2178.00 m	DEPTH	2166.64 m	DEPTH	2162.42 m
TEMP.	71.3	TEMP.		TEMP.	
FILE	ni77a.dec	FILE		FILE	

FIELD READINGS

REC. No. 70360		REC. No.	
DEFLECTION	PRESSURE kPa	DEFLECTION	PRESSURE kPa
1	24234.30	1	
2	10315.08	2	
3	7817.96	3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14	24116.64	14	

REMARKS

SEQUENCE OF TEST EVENTS:

SAMPLES LEFT WITH GEOLOGIST
Sampler drained on location.

GENERAL INFORMATION

COMPANY NORTHROCK RESOURCES LTD.
CONTACT IN CALGARY
CONTACT'S PHONE FAX
WELL NAME NORTHROCK ET AL EAST MacKAY I-77
LOCATION 64-46-41.610/125-43-10.277
K.B. 202.35 m GROUND ELEV 198.1 m
COMPANY REP BRUCE WEBBER
TESTER MARC SAMPIETRO
JAR No 1026 HYDRAULIC TOOL No 145
UNIT # SKID #2 PUMP No 82
CONTRACTOR AKITA/SAHTU RIG No 51
TICKET No 809939 DATE 2000-01-22

MUD & HOLE DATA

HOLE CONDITION @ TEST TIME:
EXCELLENT ☐ GOOD ☒ FAIR ☐ POOR ☐
WAS HOLE CONDITIONED PRIOR TO TEST: YES ☐ NO ☒
HOLE DEVIATION: YES ☐ NO ☒ AMOUNT DEGREES
CALIPER LOG RUN PRIOR TO TEST: YES ☐ NO ☒
CALIPERED HOLE SIZE @ TEST DEPTH 230 MAX. mm
MUD TYPE GEL CHEM
WEIGHT 1140 kg/m³ VISCOSITY 92 WATER LOSS 7.5
FILTER CAKE 1.5 mm
DRILL PIPE SIZE: O.D. 114 mm I.D. 91 mm WEIGHT 29.77 kg/m
DRILL COLLARS: O.D. 158 mm I.D. 74 mm RUN 75.81 m
MAIN HOLE OR CASING SIZE 222 mm
BOTTOM HOLE OR CHOKE SIZE 12.7 mm
PACKER RUBBER SIZE: DIAM. IN mm 191 LENGTH IN m 1.65
RUBBER LEFT IN HOLE: YES ☐ NO ☒
TOP PACKER: SERIAL No 2069 CONDITION 2
BTM PACKER: SERIAL No 3164 CONDITION 1

GAS MEASUREMENTS

MEASURED WITH:
SIDE STATIC ☐ CRITICAL FLOW PROVER ☐
FLOOR MANIFOLD ☐ ORIFICE WELL TESTER ☐
CLOSED CHAMBER ☒ OTHER
RISER SIZE

FLOW #	TIME	CHOKE mm	READING kPa	RATE m3/D

RECOVERY

RECOVERY VERIFICATION SIGNATURE:

TOTAL FLUID RECOVERED 170 m CONSISTING OF:
40 m OF MUD SALINITY
74 m OF MUD CUT SALT WATEER SALINITY
56 m OF SALT WATER SALINITY 80000
m OF SALINITY
TEST WAS REVERSED OUT: YES ☐ NO ☒

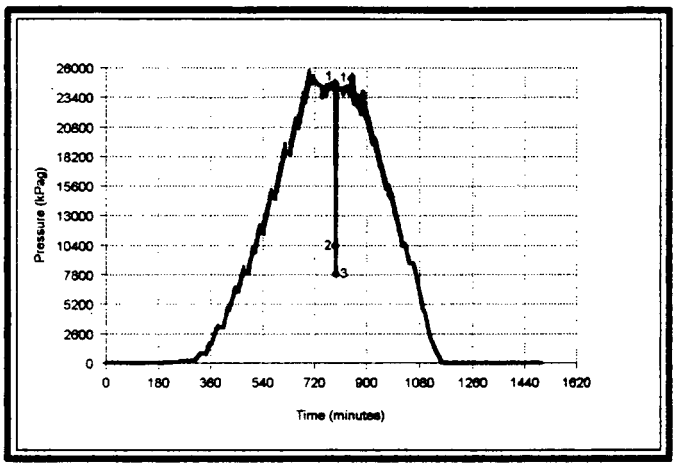
BTM. H. SAMPLER # 299 SENT TO
GAS BOMB # SENT TO
No. OF FLUID SAMPLES TAKEN 5 SENT TO

NORTHROCK ET AL EAST MacKAY I-77
64-46-41.610/125-43-10.277
DST# 1

Baker Oil Tools

Formation: ARNICA
Interval - from: 2175.00 **to:** 2204.00 m

Recorder# 70360 at 2178.00 m



Maximum Btm Hole Temperature @ FSI: 71.3 C

		Pressure (kPag)	*Time (min)*	*Extrapolated Pressure (kPag)*
1	Initial Hydrostatic	24234		
2	Start of 1st Flow	10315		
3	End of 1st Flow	7818	2.5	
14	Final Hydrostatic	24117		

Liquid Recovery of 170.00 m

Recovery	*Description*	*Salinity*
40.00 m	MUD	
74.00 m	MUD CUT SALT WATEER	
56.00 m	SALT WATER	80000

Test Date: 2000-01-22
Test Type: INFLATE STRADDLE
Tester Name: MARC SAMPIETRO
Drill Pipe O.D.: 114.00 mm
Drill Collar I.D.: 74.00 mm
Drill Collar Length: 75.81 m
Hole Size: 222.00 mm

Blow Description:

PREFLOW - CLOSED CHAMBER WITH DELTA-P. NO SEAT WHEN TIME TO SHUT-IN TOOL. PUMPED FOR 20 MIN, NO SEAT MOVED UP 1 METER PUMPED 20 MIN, NO SEAT. P.O.O.H.

Remarks:

SAMPLES LEFT WITH GEOLOGIST SAMPLER DRAINED ON LOCATION

BAKER HUGHES

Baker Oil Tools

TEST TOOL & PIPE RECORD

Well Name: NORTHROCK ET AL E... Location: 64-46-41.610/125-43... Date 2000-01-22 Ticket # 809939

Interval Tested: from 2175.00 to 2204.00 Total Depth 2400.00 Test No. 1

CONVENTIONAL

Tool	Length
Top Packer Seal Depth	
Btm Packer Seal Depth	

DRILL COLLARS				DRILL PIPE					
JOINT	LENGTH	JOINT	LENGTH						
1	0.62	11	19.18	1	19.00	11	18.24	21	18.80
2	18.61	12	0.52	2	19.04	12	19.39	22	19.20
3	18.81	13		3	19.22	13	19.12	23	18.53
4	18.07	14		4	18.91	14	18.42	24	18.73
5		15		5	18.25	15	18.64	25	19.16
6		16		6	19.05	16	19.07	26	19.06
7		17		7	19.28	17	19.16	27	19.05
8		18		8	18.93	18	19.08	28	19.15
9		19		9	19.37	19	19.24	29	18.72
10		20		10	18.88	20	19.22	30	19.30
1st TOTAL	56.11	2nd TOTAL	19.70	3rd TOTAL	189.93	4th TOTAL	189.58	5th TOTAL	189.70
31	18.85	41	19.27	51	18.56	61	18.74	71	19.14
32	19.31	42	19.26	52	19.15	62	18.62	72	18.70
33	19.22	43	19.24	53	19.14	63	19.16	73	19.08
34	18.84	44	19.08	54	18.36	64	19.16	74	18.62
35	18.07	45	18.63	55	18.79	65	18.43	75	19.15
36	18.92	46	18.52	56	18.39	66	19.14	76	19.15
37	18.59	47	19.26	57	19.13	67	19.13	77	19.21
38	19.13	48	18.95	58	19.12	68	19.12	78	19.20
39	19.09	49	19.28	59	18.17	69	19.09	79	19.18
40	18.26	50	19.22	60	19.11	70	19.11	80	18.73
6th TOTAL	188.28	7th TOTAL	190.71	8th TOTAL	187.92	9th TOTAL	189.70	10th TOTAL	190.16
81	18.60	91	19.13	101	18.82				
82	18.71	92	19.13	102	19.15				
83	18.48	93	19.23	103	19.03				
84	18.98	94	19.14	104	19.11				
85	18.17	95	18.84	105	19.13				
86	18.67	96	19.16	106	19.19				
87	19.16	97	19.12	107	19.15				
88	18.74	98	19.12	108	19.18				
89	19.17	99	19.11	109	19.15				
90	19.12	100	19.05	110	19.11				
11th TOTAL	187.80	12th TOTAL	191.03	13th TOTAL	191.02				

TOOL	15.25
1st TOTAL	56.11
2nd TOTAL	19.70
3rd TOTAL	189.93
4th TOTAL	189.58
5th TOTAL	189.70
6th TOTAL	188.28
7th TOTAL	190.71
8th TOTAL	187.92
9th TOTAL	189.70
10th TOTAL	190.16
11th TOTAL	187.80
12th TOTAL	191.03
13th TOTAL	191.02

BEFORE TEST IN DERRICK

TOTAL DRILL COLLARS	3
TOTAL DRILL PIPE	122

TESTING

	IN	OUT	TOTAL
DRILL COLLARS	3	0	3
DRILL PIPE	111	11	122

CONVENTIONAL PIPE TALLY

BELOW BOTTOM PACKER SEAL	
BETWEEN PACKER SEALS	
TOOL ABOVE PACKER SEAL	
DRILL COLLARS	
DRILL PIPE	
TOTAL STRING	
TOTAL DEPTH	
TOP SINGLE ABOVE TABLE	

INFLATE PIPE TALLY

TOOL ABOVE INTERVAL	15.25
DRILL COLLARS	75.81
DRILL PIPE	2085.83
TOTAL STRINGS ABOVE INTERVAL	2176.89
BOTTOM OF TOP PACKER SEAL DEPTH	2175.00
TOP SINGLE ABOVE TABLE	1.89

INFLATABLE

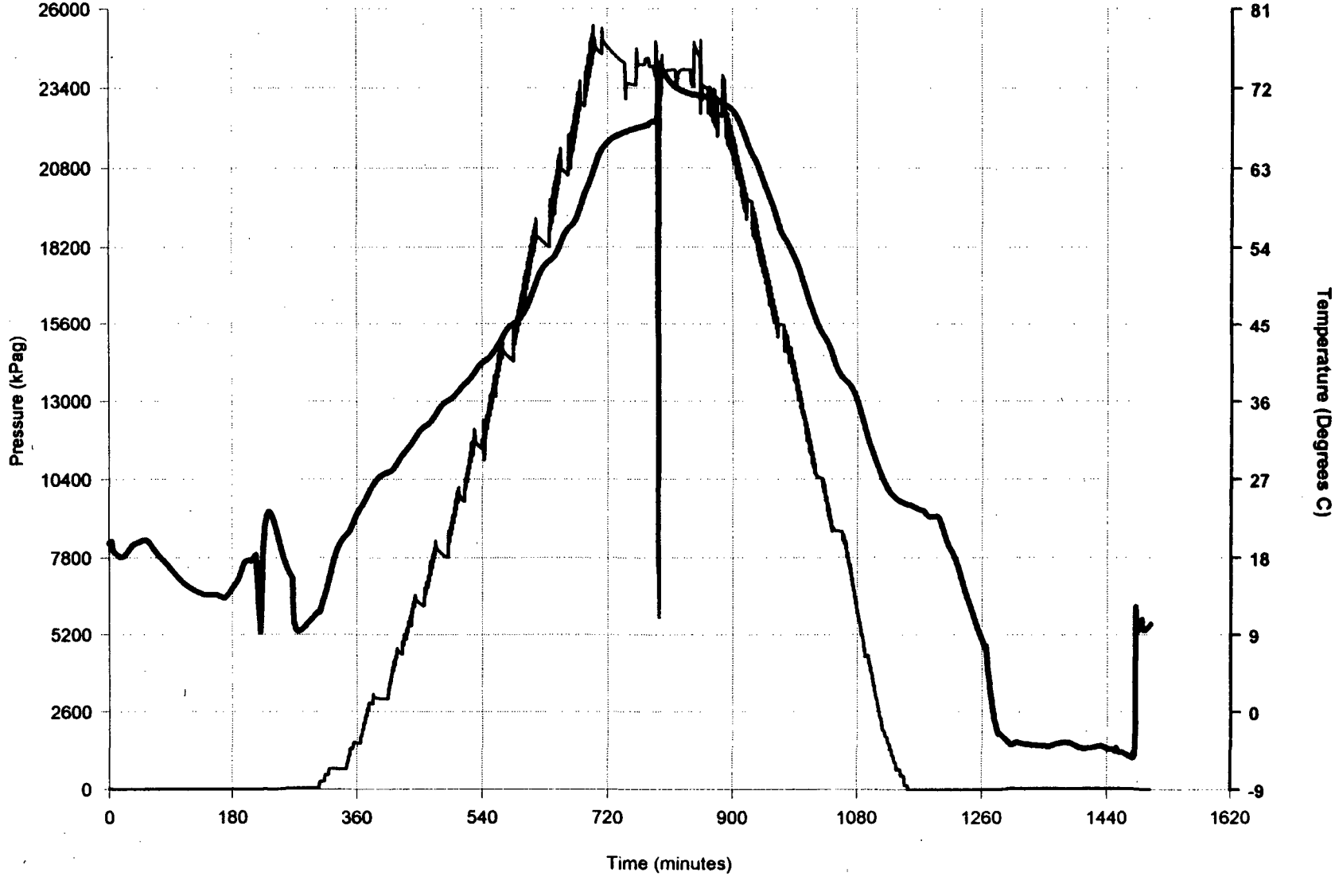
Tool	Length
POS	0.33
XOS	0.30
POS	0.83
Car	1.38
CSub	0.31
Hydr	1.50
BHS	1.03
Car	1.38
Jar	2.22
SJ	0.65
Pump	2.38
Scr	1.16
TPack	1.78
2175.0 (Top Packer Seal Depth)	
PSD	0.82
PS	0.31
Car	2.04
XOS	0.30
DC	18.10
XOS	0.30
Spg	6.71
PSU	0.42
2204.0 (Btm Packer Seal Depth)	
BPack	1.90
BS	2310

Tester Signature [signature]

Approved by Oil Co. Rep. ______

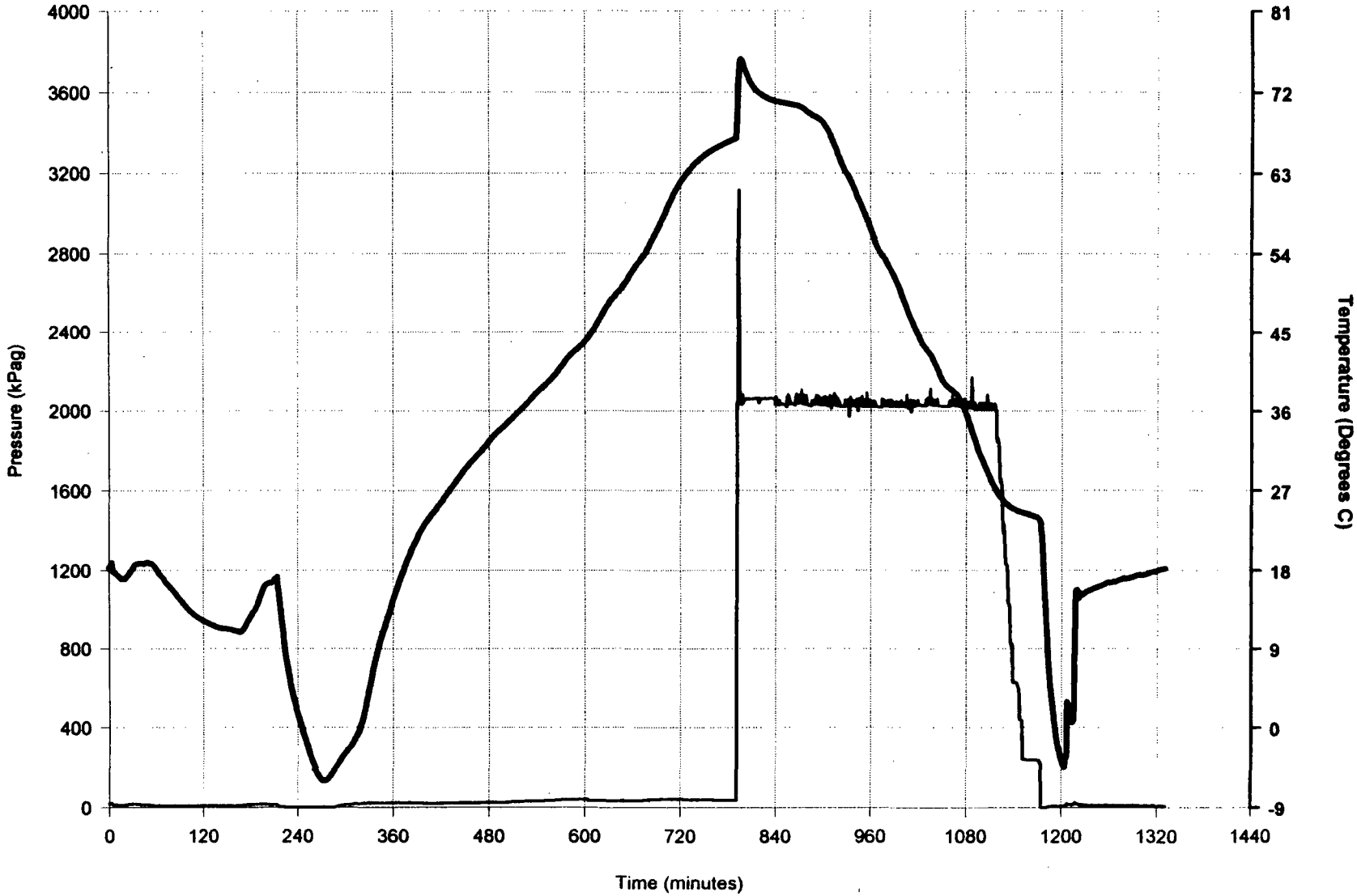
Baker Oil Tools Drill Stem Testing

NORTHROCK ET AL EAST MacKAY I-77
64-46-41.610/125-43-10.277
DST #: 1
Recorder: 70014



Baker Oil Tools Drill Stem Testing

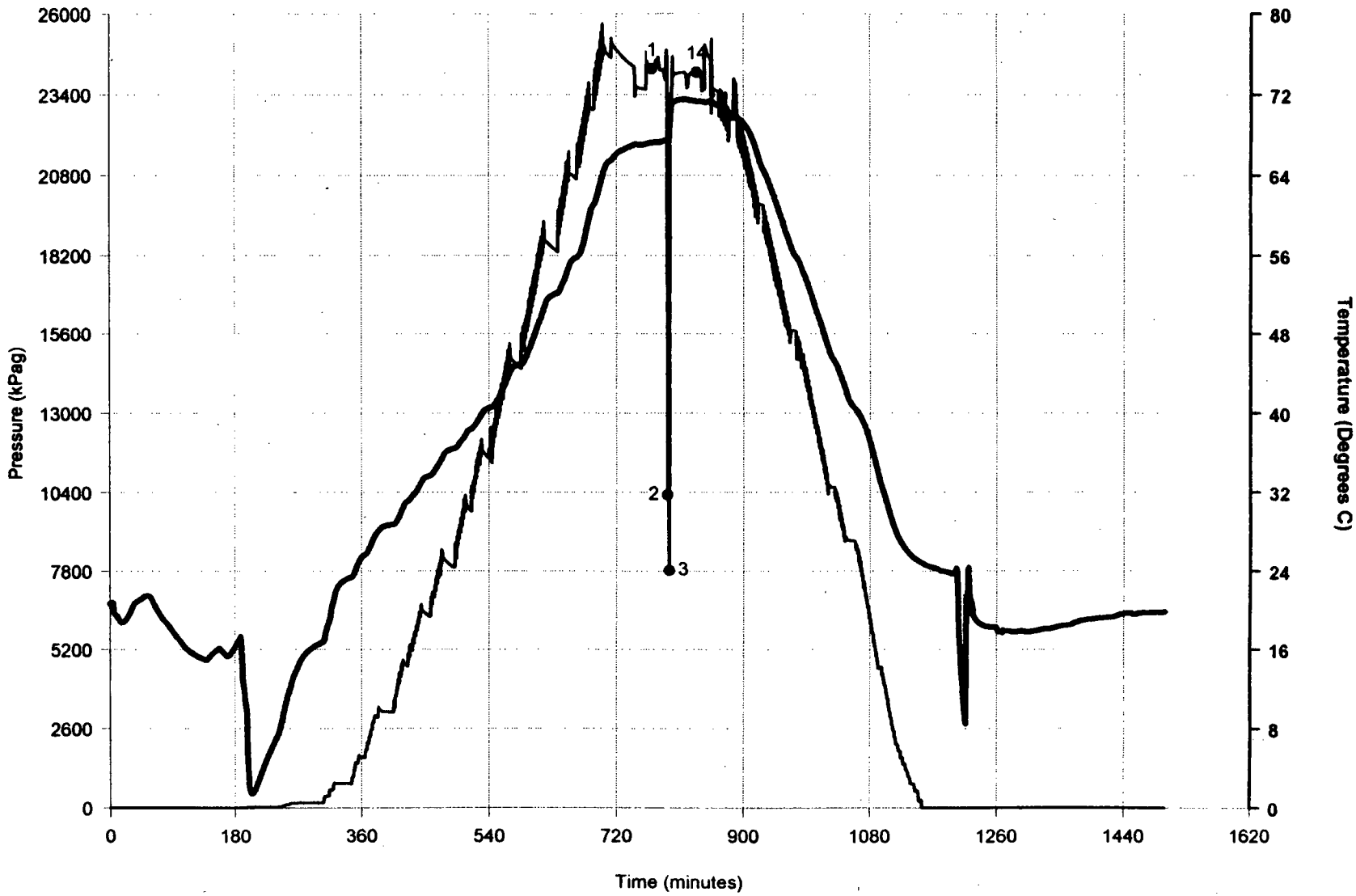
NORTHROCK ET AL EAST MacKAY I-77
64-46-41.610/125-43-10.277
DST #: 1
Recorder: 70359



Baker Oil Tools Drill Stem Testing

NORTHROCK ET AL EAST MacKAY I-77
64-46-41.610/125-43-10.277
DST #: 1
Recorder: 70360

Pressure (kPag) at Critical Points:
1: 24234 14: 24117
2: 10315
3: 7818



Appendix "B"

MWD Directional Surveys attached.....

Customer: NORTHROCK RESOURCES LTD.
WellName: NORTHROCK et al east MACKAY I-77
Location: I-7764-50-125-30

Vertical Section Calculated on: 0.0000
Survey Calculation Method: Minimum Curvature
FileName: C:\PATHTRKR\NORTH.SR3

#	Depth Meters	Inc Degrees	Azimuth Degrees	TVD Meters	North Meters	East Meters	Section Meters	Dogleg /30m
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	637.00	0.70	267.70	636.98	-0.16	-3.89	-0.16	0.03
2	775.00	0.80	253.70	774.97	-0.46	-5.65	-0.46	0.05
3	921.60	1.00	184.80	921.56	-2.02	-6.74	-2.02	0.21
4	1057.00	1.60	161.20	1056.92	-4.99	-6.23	-4.99	0.18
5	1189.80	2.20	132.60	1189.65	-8.47	-3.76	-8.47	0.25
6	1401.10	3.30	84.70	1400.73	-10.65	5.28	-10.65	0.35
7	1411.70	3.20	85.40	1411.31	-10.60	5.88	-10.60	0.30
8	1420.80	2.50	85.40	1420.40	-10.57	6.33	-10.57	2.31
9	1430.40	2.50	82.60	1429.99	-10.52	6.75	-10.52	0.38
10	1440.00	2.10	77.00	1439.59	-10.46	7.13	-10.46	1.43
11	1449.50	0.70	27.80	1449.08	-10.36	7.32	-10.36	5.45
12	1459.10	0.70	287.20	1458.68	-10.30	7.30	-10.30	3.37
13	1468.70	1.10	287.20	1468.28	-10.25	7.15	-10.25	1.25
14	1478.20	1.50	290.00	1477.78	-10.18	6.95	-10.18	1.28
15	1487.80	1.90	297.10	1487.38	-10.07	6.69	-10.07	1.41
16	1496.90	1.90	298.50	1496.47	-9.93	6.42	-9.93	0.15
17	1506.50	1.80	316.80	1506.07	-9.74	6.18	-9.74	1.86
18	1516.00	1.90	326.60	1515.56	-9.50	5.99	-9.50	1.05
19	1525.60	1.80	333.60	1525.16	-9.23	5.83	-9.23	0.77
20	1535.00	1.80	323.80	1534.55	-8.98	5.68	-8.98	0.98
21	1544.50	1.90	324.50	1544.05	-8.73	5.50	-8.73	0.32
22	1554.10	1.90	321.00	1553.64	-8.48	5.31	-8.48	0.36
23	1563.70	2.20	326.60	1563.23	-8.20	5.11	-8.20	1.13
24	1573.20	2.20	324.50	1572.73	-7.90	4.90	-7.90	0.25
25	1582.40	2.00	334.30	1581.92	-7.61	4.73	-7.61	1.34
26	1592.00	2.00	326.60	1591.52	-7.32	4.56	-7.32	0.84
27	1601.20	1.90	330.10	1600.71	-7.05	4.40	-7.05	0.51
28	1610.80	0.70	333.40	1610.31	-6.86	4.29	-6.86	3.76
29	1620.30	0.30	318.20	1619.81	-6.79	4.25	-6.79	1.32
30	1629.80	0.30	12.30	1629.31	-6.75	4.24	-6.75	0.86
31	1639.40	0.40	10.90	1638.91	-6.69	4.25	-6.69	0.31
32	1648.50	0.40	7.40	1648.01	-6.63	4.26	-6.63	0.08
33	1657.40	0.40	4.60	1656.91	-6.57	4.27	-6.57	0.07

Customer: NORTHROCK RESOURCES LTD.
WellName: NORTHROCK et al east MACKAY I-77
Location: I-7764-50-125-30

Vertical Section Calculated on: 0.0000
Survey Calculation Method: Minimum Curvature
FileName: C:\PATHTRKR\NORTH.SR3

#	Depth Meters	Inc Degrees	Azimuth Degrees	TVD Meters	North Meters	East Meters	Section Meters	Dogleg /30m
34	1666.90	0.70	3.20	1666.41	-6.48	4.27	-6.48	0.95
35	1676.50	1.00	341.40	1676.01	-6.34	4.25	-6.34	1.36
36	1685.90	0.90	346.30	1685.40	-6.19	4.21	-6.19	0.41
37	1695.00	1.10	349.10	1694.50	-6.04	4.17	-6.04	0.68
38	1704.60	1.50	355.40	1704.10	-5.82	4.15	-5.82	1.33
39	1714.20	1.50	6.70	1713.70	-5.57	4.15	-5.57	0.92
40	1723.70	2.00	18.60	1723.19	-5.29	4.22	-5.29	1.94
41	1733.30	2.20	20.80	1732.79	-4.96	4.34	-4.96	0.67
42	1742.90	2.50	30.60	1742.38	-4.61	4.51	-4.61	1.56
43	1752.50	2.90	39.00	1751.97	-4.24	4.77	-4.24	1.76
44	1761.50	2.50	41.80	1760.96	-3.91	5.04	-3.91	1.40
45	1771.10	2.00	72.10	1770.55	-3.71	5.34	-3.71	3.97
46	1780.70	2.20	67.90	1780.14	-3.58	5.67	-3.58	0.79
47	1790.20	2.40	60.10	1789.64	-3.42	6.01	-3.42	1.17
48	1799.80	1.90	49.60	1799.23	-3.21	6.31	-3.21	1.98
49	1809.40	1.60	52.40	1808.82	-3.03	6.54	-3.03	0.97
50	1819.00	1.30	51.00	1818.42	-2.88	6.73	-2.88	0.94
51	1828.10	1.20	22.20	1827.52	-2.73	6.84	-2.73	2.07
52	1837.60	1.60	0.40	1837.02	-2.50	6.88	-2.50	2.08
53	1847.20	2.20	4.60	1846.61	-2.18	6.90	-2.18	1.92
54	1856.80	2.60	10.20	1856.20	-1.78	6.95	-1.78	1.45
55	1866.30	2.80	36.20	1865.69	-1.39	7.13	-1.39	3.88
56	1875.90	2.30	69.30	1875.28	-1.13	7.44	-1.13	4.78
57	1885.50	2.10	81.20	1884.88	-1.03	7.80	-1.03	1.55
58	1894.60	2.00	95.30	1893.97	-1.02	8.12	-1.02	1.69
59	1903.20	1.80	109.30	1902.57	-1.08	8.40	-1.08	1.76
60	1913.60	1.10	150.80	1912.96	-1.22	8.60	-1.22	3.51
61	1923.20	1.10	143.80	1922.56	-1.38	8.70	-1.38	0.42
62	1932.40	0.90	164.20	1931.76	-1.52	8.77	-1.52	1.32
63	1942.00	1.10	165.60	1941.36	-1.68	8.82	-1.68	0.63
64	1951.00	1.10	155.10	1950.36	-1.84	8.87	-1.84	0.67
65	1961.10	1.30	134.00	1960.45	-2.01	9.00	-2.01	1.43
66	1970.70	0.20	139.60	1970.05	-2.10	9.09	-2.10	3.44
67	1980.30	0.70	283.70	1979.65	-2.10	9.04	-2.10	2.72

Customer: NORTHROCK RESOURCES LTD.
WellName: NORTHROCK et al east MACKAY I-77
Location: I-7764-50-125-30

Vertical Section Calculated on: 0.0000
Survey Calculation Method: Minimum Curvature
FileName: C:\PATHTRKR\NORTH.SR3

#	Depth Meters	Inc Degrees	Azimuth Degrees	TVD Meters	North Meters	East Meters	Section Meters	Dogleg /30m
68	1989.30	1.20	284.80	1988.65	-2.06	8.90	-2.06	1.67
69	1998.90	0.90	285.80	1998.25	-2.01	8.73	-2.01	0.94
70	2008.40	1.20	280.90	2007.75	-1.97	8.56	-1.97	0.99
71	2017.60	0.80	318.90	2016.95	-1.91	8.42	-1.91	2.46
72	2027.10	0.50	307.60	2026.45	-1.83	8.34	-1.83	1.03
73	2036.70	0.60	313.30	2036.05	-1.77	8.27	-1.77	0.36
74	2040.00	0.60	315.40	2039.35	-1.75	8.25	-1.75	0.20
75	2046.30	0.50	299.20	2045.65	-1.71	8.20	-1.71	0.88
76	2055.90	0.40	322.40	2055.25	-1.66	8.14	-1.66	0.64
77	2065.50	0.70	318.20	2064.85	-1.59	8.09	-1.59	0.95
78	2075.00	0.40	328.10	2074.34	-1.52	8.03	-1.52	0.99
79	2084.60	0.30	347.00	2083.94	-1.47	8.01	-1.47	0.47
80	2094.20	0.60	21.50	2093.54	-1.40	8.02	-1.40	1.22
81	2103.80	0.60	51.70	2103.14	-1.32	8.08	-1.32	0.98
82	2113.30	0.40	42.50	2112.64	-1.26	8.14	-1.26	0.68
83	2122.90	0.50	50.30	2122.24	-1.21	8.19	-1.21	0.37
84	2132.60	0.90	67.20	2131.94	-1.16	8.30	-1.16	1.38
85	2142.10	0.90	59.40	2141.44	-1.09	8.43	-1.09	0.39
86	2151.70	1.00	67.90	2151.04	-1.02	8.57	-1.02	0.54
87	2161.20	1.30	68.60	2160.54	-0.95	8.75	-0.95	0.95
88	2170.80	1.30	81.90	2170.14	-0.89	8.96	-0.89	0.94
89	2180.40	1.40	80.50	2179.73	-0.86	9.18	-0.86	0.33
90	2190.00	1.30	84.70	2189.33	-0.83	9.40	-0.83	0.44
91	2199.60	1.10	84.00	2198.93	-0.81	9.60	-0.81	0.63
92	2209.20	1.10	84.00	2208.53	-0.79	9.79	-0.79	0.00
93	2218.80	1.40	79.10	2218.12	-0.76	9.99	-0.76	0.99
94	2228.40	1.20	84.70	2227.72	-0.73	10.21	-0.73	0.74
95	2237.90	1.50	94.60	2237.22	-0.73	10.43	-0.73	1.20
96	2247.10	1.60	96.00	2246.42	-0.75	10.68	-0.75	0.35
97	2257.10	1.60	98.80	2256.41	-0.79	10.96	-0.79	0.23

Closure is 10.9859 Meters on an azimuth of 94.1116