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Geological Report

NORTHROCK et al Fall Stone F-01

F - 01 - 64 - 50 - 125 - 45

N.W.T.

By:

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11-Feb-00

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WELL DATA:**Operator:** Northrock Resources Ltd. **AFE:** 990436**Well Name:** NORTHROCK et al Fall Stone F-01 **Wid #:** 1886**Field:** Undefined **UWI:** 300F016450125450**Surface Co-ordinates:** Lat: 64^{deg} 40' 29.045" Long: 125^{deg} 46' 13.995"**Well Status:** Exploratory Plugged & Abandoned**Contractor:** Akita/Sahtu Ptnshp. **Rig:** 51**Spud Date:** 27-Jan-00 @ 2200hrs **TD Date:** 07-Feb-00 @ 2100hrs**Total Depth:** 1400.00m Driller **Rig Release:** 10-FEB-00
1394.00m Logger**Elevations:** **Kelly Bushing:** 203.80m **Ground Level:** 198.60m**Hole Size:** 311mm to 353m, 222mm to FTD.**Casing Record:****Surface Casing:** 244.5mm, 53.6m kg/m, ST&C, J-55, set at 342.0m.**Mud Type:** Floc water to 1050m. Gel/chem to FTD.**Logs Run:**

| | | |
|---------------------------|-------|---------------|
| BHCS-GR-CAL | TD-SC | GR to Surface |
| CNL-LDT-PE-GR-DAC/DITE-SP | TD-SC | |

Drill Stem Tests: None**Cores:** None**Rotating Hours:**

| | |
|---------------|-----------|
| Surface Hole: | 47.50 hrs |
| Main Hole: | 86.75 hrs |

Supervision:

| | |
|------------|--------------------|
| Foreman: | Garry Campanuik |
| Geologist: | David N.K. Roberts |

FORMATION TOPS:**Elevations:** Ground Level: 198.60m Kelly Bushing: 203.80m

| Formation | Prog MD | Prog SS | Smpl MD | Log MD | Log SS |
|-------------------|---------|---------|---------|--------|---------|
| Little Bear | 445.8 | - 243 | 434 | 426.0 | - 222.2 |
| Slater River | 910.8 | - 708 | 897 | 894.7 | - 690.9 |
| R/A Shale | 1155.8 | - 953 | 1148 | 1145.7 | - 941.9 |
| Basal K Sand | 1300.8 | -1098 | N/D | N/D | N/D |
| Devonian Imperial | 1333.8 | -1131 | 1305 | ? | |
| Total Depth | 1400.0 | -1197 | 1400 | 1394.0 | -1190.2 |

BIT RECORD:

| Bit | Size | Type | Depth Out | Meters | Hours | WOB dan | RPM | Condition |
|-----|------|-----------------|-----------|--------|-------|---------|--------|-----------|
| 1a | 311 | Reed HP13G | 32 | 32 | 5.00 | 5 | 180 | 8:6:0 |
| 2a | 311 | Smith SSH | 42 | 10 | 6.25 | 5 | 180 | 6:6:0 |
| 3a | 444 | Smith SCE | 42 | 42 | 6.75 | 14 | 180 | 6:4:0 |
| 1b | 311 | Smith SSH | 217 | 175 | 13.50 | 5 | 180 | 6:4:0 |
| 2b | 311 | Smith FDSSHC | 353 | 136 | 16.00 | 5 | 180 | 5:3:0 |
| 1 | 222 | Hughes A86G1 | 1087 | 734 | 42.75 | 12-16 | 100+40 | 3:2:0 |
| 2 | 222 | Hughes G1XL | 1400 | 313 | 44.00 | 12-16 | 100+40 | 2:2:0 |

SURVEYS

| Depth | Inclination |
|--------------|--------------------|
| 49m | 0.875 |
| 79m | 0.750 |
| 107m | 0.500 |
| 136m | 0.250 |
| 160m | 0.750 |
| 205m | 1.000 |
| 223m | 1.500 |
| 242m | 1.000 |
| 261m | 1.250 |
| 280m | 1.750 |
| 299m | 1.500 |
| 315m | 1.750 |
| 348m | 1.500 |
| Set | 244mm |

MWD directional surveys run below surface casing.

See Appendix "A"

SAMPLE DESCRIPTIONS:

350-355m Shale: 85%, grey, blocky, silty in part, occasional sandy streaks, trace carbonaceous flecks.
 Cement: 15%.

355-360m Shale: 95%, as above.
 Cement: 5%.

360-400m Shale: 100%, grey to dark grey, blocky, silty in part, local pyrite, trace sideritic in part, trace fossiliferous.

400-410m Shale: 100%, grey, blocky, silty, sandy in part, local trace pyrite.

Little Bear log top at 426.0m.

410-430m Shale: 100%, grey to dark grey, blocky to subfissile, silty in part, micromicaceous, trace pyrite, local trace glauconite.

430-435m Shale: 40%, as above.
 Sandstone: 60%, salt and pepper textured, fine to coarse grained, moderate to well sorted, angular to subangular clasts, poor to moderate sorting, loose grains, common chert pebbles, yellow and red chert.

435-440m Shale: 30%, as above.
 Sandstone: 70%, as above.

440-450m Shale: 20%, as above.
 Sandstone: 80%, salt and pepper textured, fine to medium grained, commonly coarse grained, abundant chert pebbles and granules, angular to subrounded clasts, moderate to well cemented with silica, fair to good porosity. Grey/black, orange and yellow chert clasts.

450-460m Shale: 10%, as above.
 Siltstone: 80%, off white to light grey, kaolinitic, tight.
 Sandstone: 10%, as above.

460-470m Shale: 10%, as above.
 Sandstone: 90%, salt and pepper textured, fine to medium grained, common coarse to very coarse grained, common pebbles, well sorted, kaolinitic, angular to subangular clasts, moderately cemented with silica, quartz overgrowths, fair to good porosity (8-12%), trace dead oil staining, brownish cast, no fluorescence, no cut fluorescence.

470-480m Shale: Trace.
 Sandstone: 100%, salt and pepper textured, fine grained, well sorted, moderate to well cemented with silica, quartz overgrowths, fair to good porosity in part, common very coarse grained and pebbly.

480-490m Shale: Trace.
 Sandstone: 100%, as above, abundant kaolinite, fair porosity in part.

490-500m Sandstone: 100%, as above, common carbonaceous fragments, common chert pebbles, kaolinitic.

500-510m Shale: 30%, as above.
 Coal: 70%, black, subvitreous to earthy, commonly very shaly.

510-520m Shale: 100%, grey to dark grey, blocky, silty in part, local carbonaceous plant remains, local very fine sandy streaks.

520-530m Shale: 10%, as above.
 Sandstone: 90%, salt and pepper textured, fine to coarse grained, well sorted, angular to subangular clasts, poor to moderately cemented with silica and kaolinite, fair to good porosity in part, rare glauconite.

530-540m Shale: 10%, as above.
 Sandstone: 90%, light grey, salt and pepper textured, very fine grained to fine grained and silty, moderate sorting, well cemented, kaolinitic, tight.

540-550m Shale: 90%, generally dark grey, subfissile, micromicaceous, silty, common sandy laminations.
 Sandstone: 10%, as above.

550-560m Shale: 40%, dark grey, blocky, sideritic in part, trace glauconite grains.
 Sandstone: 60%, salt and pepper textured, fine to coarse grained, well sorted, angular to subangular clasts, moderate to well cemented with silica, kaolinitic in part, fair to good porosity?

560-570m Shale: 30%, as above, sideritic in part.
 Sandstone: 70%, light grey, salt and pepper textured, very fine to fine grained, silty, moderate sorting, well cemented, kaolinitic, tight.

570-580m Shale: 20%, as above.
 Sandstone: 80%, as above. Also, fine to coarse grained, in part very coarse grained, well sorted, fair to good porosity.

580-590m Shale: 5%, as above.
 Sandstone: 95%, light grey, salt and pepper textured, very fine to fine grained, silty, poor to moderate sorting, kaolinitic, trace porosity in part.

590-600m Shale: 20%, dark grey to dark grey/brown, subfissile to fissile, sandy in part, micromicaceous.
 Sandstone: 80%, as above.

600-610m Sandstone: 100%, salt and pepper textured, fine to coarse grained, well sorted, angular to subrounded clasts, moderate to well cemented with silica, quartz overgrowths, fair to good porosity.

610-620m Sandstone: 100%, light grey, salt and pepper textured, very fine to fine grained, silty in part, moderate to well sorted, moderately cemented with silica and kaolinite, fair porosity in part.

620-625m Shale: 10%, grey to dark grey, blocky, silty and sandy in part.
 Sandstone: 90%, as above, poor to moderate sorting, kaolinitic, tight.

625-630m Shale: 50%, black, subfissile to fissile, micromicaceous, carbonaceous in part.
 Sandstone: 50%, white/clear, black, salt and pepper textured, fine to medium grained, well sorted, angular to subrounded clasts, moderately cemented with silica and kaolinite, fair to good porosity.

630-635m Shale: 10%, as above.
 Sandstone: 90%, as above.

635-640m Shale: 100%, grey, blocky.

640-645m Shale: 50%, as above.
 Sandstone: 50%, as above, becoming light grey salt and pepper textured, very fine to fine grained, moderate to well sorted, well cemented and tight, kaolinitic.

645-650m Shale: 30%, as above.
 Sandstone: 70%, as above.

650-655m Sandstone: 100%, light grey, salt and pepper textured, very fine to fine grained, moderate to well sorted, well cemented with kaolinite and silica, tight.

655-660m Sandstone: 100%, as above. Also; salt and pepper textured, medium to coarse grained, well sorted, angular to subrounded clasts, moderately cemented with silica, fair to good porosity.

660-665m Sandstone: 100%, as above, medium to very coarse grained, fair to good porosity.

665-670m Sandstone: 100%, as above, in part becoming fine to medium grained.

670-680m Shale: 100%, dark grey, subfissile to blocky, flat luster.

680-685m Shale: 70%, as above.
 Sandstone: 30%, light grey, salt and pepper textured, very fine grained and silty, well cemented and tight, kaolinitic.

685-690m Shale: 30%, as above.
 Sandstone: 70%, as above.

690-695m Shale: 40%, as above.
 Sandstone: 60%, as above.

695-700m Shale: 70%, dark grey, blocky, very silty.
 Sandstone: 30%, grey, very fine grained and silty, argillaceous, tight.

700-705m Shale: 100%, dark grey, blocky, silty in part.

705-710m Shale: 80%, as above.
 Sandstone: 20%, grey, very fine grained and silty, tight.

710-715m Shale: 5%, as above, common siderite.
 Sandstone: 95% light grey, salt and pepper textured very fine to fine grained and silty, poor to moderate sorting, kaolinitic, well consolidated and tight, abundant siderite.

715-720m Sandstone: 100%, as above, trace siderite, tight.

725-730m Shale: 80%, dark grey, blocky, locally very silty.
 Sandstone: 20%, as above, argillaceous, tight.

730-735m Shale: 70%, as above.
 Sandstone: 30%, grey, very fine grained and silty, argillaceous, tight.

Trip for MWD failure at 737m. Rerun drill bit.

735-740m Shale: 30%, dark grey, blocky, flat luster.
 Sandstone: 70%, light grey to grey, salt and pepper textured, very fine to fine grained, silty, moderate sorting, argillaceous in part, well cemented and tight.

740-745m Shale: 20%, as above, trace pyrite.
 Sandstone: 80%, white/clear, black, salt and pepper textured, salt and pepper textured, fine to coarse grained, well sorted, angular to subangular clasts, well cemented with silica, trace porosity in part.

745-750m Shale: 70%, as above.
 Sandstone: 30%, as above.

750-755m Shale: 30%, as above.
 Sandstone: 70%, light grey to grey, salt and pepper textured, very fine to fine grained and silty, poor to moderate sorting, well cemented with silica and kaolinite, tight, carbonaceous flecks.

755-765m Shale: 20%, as above.
 Sandstone: 80%, as above.

765-775m Shale: 100%, dark grey, blocky to subfissile, micro-micaceous in part.

775-780m Shale: 5%, as above.
 Sandstone: 95%, grey, salt and pepper textured, very fine grained and silty, fine grained in part, poor to moderate sorting, well cemented with silica, kaolinitic, carbonaceous flecks.

780-785m Shale: 20%, dark grey, blocky to subfissile, commonly silty.
 Sandstone: 80%, as above.

785-790m Shale: 70%, as above.
 Sandstone: 30%, as above.

790-795m Shale: 80%, as above.
 Sandstone: 20%, as above.

795-800m Shale: 10%, dark grey to black, blocky, silty in part.
 Sandstone: 90%, light grey, salt and pepper textured, very fine to fine grained, silty, moderate sorting, well cemented, kaolinitic, tight.

800-805m Shale: 5%, as above.
 Sandstone: 95%, light grey to grey, as above, becoming very fine grained and silty, poor to moderate sorting, well cemented and tight.

805-810m Shale: 20%, dark grey, in part brown, blocky, locally sideritic.
 Sandstone: 80%, light grey, salt and pepper textured, very fine to fine grained, silty in part, moderate to well sorted, angular clasts, well cemented, kaolinitic, tight.

810-815m Shale: 15%, as above.
 Sandstone: 85%, as above, becoming very fine grained and silty in part.

815-820m Shale: 90%, dark grey, blocky, commonly silty/sandy, silty/sandy streaks.
 Sandstone: 10%, as above.

820-825m Shale: Trace.
 Sandstone: 100%, white/clear, black, salt and pepper textured, very fine to fine grained, well sorted, angular clasts, well cemented with silica and kaolinite, abundant siderite in part, tight to trace porosity.

825-830m Shale: 50%, grey to dark grey, blocky to subfissile, silty/sandy in part.
 Sandstone: 50%, light grey, salt and pepper textured, very fine to fine grained, silty, poor to moderate sorting, well cemented and tight.

830-835m Shale: 100%, dark grey, blocky, silty, locally very sandy.

835-840m Shale: 20%, as above.
 Sandstone: 80%, as above.

840-850m Shale: 100%, as above, generally silty/sandy.

850-860m Shale: 100%, dark grey, blocky, flat luster, silty in part.

860-865m Shale: 100%, as above, local white specks.

865-870m Sandstone: 100%, white/clear, black, salt and pepper textured, fine to coarse grained, well sorted, angular clasts, poorly consolidated with kaolinite, tight??

870-875m Sandstone: 100%, as above, becoming moderate to well cemented with silica, common pyrite cement, fair to good porosity, quartz overgrowths.

875-880m Sandstone: 100%, as above, well cemented with silica, tight to trace porosity, quartz overgrowths, rare pebbles.

880-885m Sandstone: 100%, light grey to white/clear, black, salt and pepper textured, fine grained in part, medium grained, well sorted, well cemented with silica, kaolinitic, tight to trace porosity, carbonaceous fragments in part.

885-890m Shale: Trace.
 Sandstone: 100%, as above, generally very fine to fine grained, well sorted, well cemented with silica, tight.

Slater River log top at 894.7m.

890-895m Shale: Trace.
 Sandstone: 100%, light grey, salt and pepper textured, very fine to fine grained, moderate to well sorted, well cemented with silica and kaolinite, tight, carbonaceous fragments.

895-900m Shale: 20%, dark grey, blocky, flat luster, micro-micaceous in part.
 Sandstone: 80%, as above, becoming very fine grained to fine grained and silty, poor to moderate sorting, well cemented and tight.

900-905m Shale: 50%, as above.
 Sandstone: 50%, as above.

905-910m Shale: 90%, dark grey, blocky to subfissile, local silty laminations, trace carbonaceous plant remains.
 Sandstone: 10%, as above, generally very fine grained and silty, tight.

910-920m Shale: 100%, as above, occasional sandy streaks.

920-945m Shale: 90%, as above.
 Sandstone: 10%, light grey, salt and pepper textured, very fine to fine grained, silty, poor to moderate sorting, well cemented and tight.

945-960m Shale: 80%, as above.
 Sandstone: 20%, as above.

960-965m Shale: 90%, as above, abundant sandy streaks.
 Sandstone: 10%, as above.

965-975m Shale: 100%, as above, common sandy streaks.

975-1005m Shale: 90%, dark grey, blocky to subfissile, commonly silty/sandy streaks.
 Sandstone: 10%, as above.

1005-1010m Shale: 100%, as above, common silty/sandy streaks.

1010-1025m Shale: 100%, dark grey, blocky to subfissile, common silty streaks.

1025-1035m Shale: 100%, dark grey, subfissile to blocky, micro-micaceous, local silty/sandy streaks, flat luster.

1035-1045m Shale: 100%, as above, trace silty laminations.

1045-1070m Shale: 100%, dark grey, subfissile to fissile, micromicaceous in part, flat luster, common silty/sandy laminations in part, rare pyrite in part.

1070-1075m Shale: 95%, as above, fissile to blocky, micromicaceous in part, flat luster.
Sandstone: 5%, white/clear, salt and pepper textured, fine to medium grained, well sorted, loose grains, porosity??

1075-1085m Shale: 100%, dark grey, subfissile to fissile, micromicaceous in part, trace silty/sandy streaks.

Trip for bit at 1087m.

1085-1090m Shale: 90%, dark grey, blocky to subfissile, silty in part.
Sandstone: 10%, light grey to grey, salt and pepper textured, very fine to fine grained, silty, in part very fine grained and silty, moderate sorting, well cemented and tight.

1090-1115m Shale: 95%, as above.
Sandstone: 5%, as above.

1115-1120m Shale: 80%, as above.
Sandstone: 20%, light grey to grey, very fine to fine grained and silty, moderate sorting, well cemented and tight.

1120-1125m Shale: 90%, dark grey, blocky to subfissile, commonly silty, flat luster in part.
Sandstone: 10%, as above.

1125-1135m Shale: 90%, as above, common siderite in part.
Sandstone: 10%, as above.

1135-1140m Shale: 95%, dark grey, subfissile to fissile, flat luster, abundant siderite in part.
Sandstone: 5%, as above.

1140-1145m Shale: 100%, as above, abundant siderite.

Radioactive Shale log top at 1145.7m.

1145-1165m Shale: 100%, dark grey to black, fissile, flat luster, trace sideritic in part.

1165-1170m Shale: 100%, as above, trace slickensided quartz fracture fill.

1170-1195m Shale: 100%, black, subfissile, flat luster, trace fish scales in part, rare pyrite in part, rare micro veining in part.

1195-1225m Shale: 100%, black, subfissile to fissile, flat luster, trace *Inoceramus* sp., trace fish scales.

1225-1230m Shale: 90%, as above.
Sandstone: 10%, dark grey, fine to medium grained, well sorted, subrounded to rounded clasts, polished and frosted quartz grains, "plated" the pyrite in part, well cemented with calcite and silica, silty matrix, tight, trace glauconite grains.

1230-1235m Shale: 100%, as above, *Inoceramus* sp.
Sandstone: Trace.

1235-1240m Shale: 100%, blocky, subfissile to blocky, flat luster, abundant fossils in part.

1240-1245m Shale: 100%, as above, no fossils.

1245-1250m Shale: 100%, as above, generally blocky and silty.

1250-1260m Shale: 100%, dark grey to black, blocky, silty.

1260-1265m Shale: 95%, dark grey to black, subfissile to blocky, rare sandy streak, abundant carbonaceous plant remains, fish scales.
Coal: 5%, black, vitreous, commonly shaly.

1265-1267.5m Shale: 95%, dark grey, grey/brown, black, subfissile, carbonaceous plant remains, locally very sandy and silty, fossiliferous.

1267.5-1270m Shale: 80%, as above, local silty streaks.
Coal: 20%, as above.

1270-1272.5m Shale: 100%, dark grey, dark grey/brown, subfissile, abundant carbonaceous plant remains, local silty/sandy streaks, locally coaly.

1272.5-1275m Shale: 50%, as above.
 Siltstone: 50%, off white to light grey/brown, blocky, non sandy, abundant foraminifera.

1275-1277.5m Shale: 30%, as above.
 Siltstone: 70%, as above.

1277.5-1280m Shale: 40%, abundant dark cavings. Also; common light grey, waxy luster, abundant foraminifera.
 Siltstone: 60%, as above, locally becoming moderately sandy, abundant foraminifera.

1280-1282.5m Shale: Trace, light grey/brown, waxy luster, abundant foraminifera.
 Siltstone: 80%, off white to light grey/brown, blocky, generally very fine sandy, scattered fine to medium well rounded quartz grains, well cemented and tight, abundant foraminifera in part, grading to sandstone in part.
 Sandstone: 20%, off white to light grey, quartzitic, very fine grained and silty, scattered fine to medium well rounded quartz grains, poor sorting, shaly/silty matrix.

1285-1287.5m Shale: 40%, light grey/brown to grey/brown, abundantly sandy in part.
 Siltstone: 30%, as above.
 Sandstone: 30%, as above, loose subangular to rounded clasts, probable shaly/silty matrix.

1287.5-1290m Shale: 50%, off white, soft, abundant fine to medium quartz grains, subrounded to rounded clasts, (washed out of shaly matrix, common foraminifera.
 Siltstone: 50%, as above, locally grading to poorly sorted sandstone, common foraminifera.

1290-1292.5m Shale: 30%, as above.
 Siltstone: 70%, as above.

1292.5-1295m Shale: 10%, as above.
 Siltstone: 90%, as above.

1295-1297.5m Shale: 10%, as above.
 Siltstone: 90%, as above.
 Conglomerate: Trace, tripolitic chert pebbles.

1297.5-1300m Siltstone: 95%, off white to light brown, hard, local anhydritic patches, locally carbonaceous, local trace coarse sandy streaks.
Conglomerate: 5%, off white to light brown, tripolitic chert clasts, fine to coarse sand grains in a tight (locally brown) siltstone matrix, (dead oil?), no fluorescence, no cut fluorescence.

1300-1302.5m Siltstone: 10%, as above locally very hard and siliceous, tight.
Conglomerate: 90%, as above, minor dark brown, grey, mottled, silty matrix, tight, common clear coarse to very coarse quartz clasts, shaly matrix in part.

1302.5-1305m Shale: 10%, dark cavings.
Conglomerate: 90%, as above.

Devonian Imperial Shale sample top at 1305m.

1305-1307.5m Siltstone: 100%, light grey, firm, in part very fine sandy, moderately cemented and tight, fine disseminated carbonaceous flecks throughout.

1307.5-1310m Siltstone: 100%, as above.

1310-1312.5m Siltstone: 100%, as above.

1312.5-1315m Shale: 20%, grey, blocky, very silty, micromicaceous in part.
Siltstone: 80%, light grey to grey, blocky, argillaceous in part, fine disseminated carbonaceous flecks throughout, grading to silty shale in part.

1315-1317.5m Shale: 60%, grey, blocky to subfissile, silty, micro-micaceous.
Siltstone: 40%, light grey to grey, slightly argillaceous in part, mica flakes, fine disseminated carbonaceous flecks.

1317.5-1320m Shale: 70%, as above.
Siltstone: 30%, as above.

1320-1335m Shale: 80%, grey to dark grey, subfissile to fissile, silty, micromicaceous.
Siltstone: 20%, grey, argillaceous, mica flakes, carbonaceous flecks disseminated throughout.

| | |
|--------------|--|
| 1335-1342.5m | Shale: 80%, grey to dark grey, blocky to subfissile, micromicaceous, commonly silty. Siltstone: 20%, grey, commonly very fine sandy, common carbonaceous flecks, mica flakes, grading to silty shale. |
| 1342.5-1350m | Shale: 80%, grey, blocky to subfissile, silty, micro-micaceous. Siltstone: 20%, grey, argillaceous, mica flakes, trace carbonaceous flecks. |
| 1350-1355m | Shale: 80%, grey to dark grey, blocky to subfissile, silty in part, flat luster in part. Siltstone: 20%, grey, very fine sandy in part, argillaceous, disseminated carbonaceous flecks. |
| 1355-1362.5m | Shale: 90%, as above. Sandstone: 10%, as above, locally becoming very sandy. |
| 1362.5-1365m | Shale: 70%, as above. Siltstone: 30%, as above. |
| 1365-1367.5m | Shale: 80%, as above. Siltstone: 20%, as above. |
| 1367.5-1380m | Shale: 90%, dark grey, subfissile to fissile, silty in part, micromicaceous, local silty streaks. Siltstone: 10%, as above, grey, very fine sandy in part, tight. |
| 1380-1382.5m | Shale: 80%, as above. Siltstone: 20%, as above. |
| 1382.5-1385m | Shale: 100%, as above. |
| 1385-1390m | Shale: 80%, as above. Siltstone: 20%, off white to light grey, commonly very fine sandy, well cemented and tight, common carbonaceous flecks. |
| 1390-1392.5m | Shale: 90%, as above. Siltstone: 10%, as above. |
| 1392.5-1395m | Shale: 70%, as above. Siltstone: 30%, as above. |

1395-1400m Shale: 90%, dark grey, blocky, micromicaceous, silty in part.
 Siltstone: 10%, grey, blocky, very fine sandy, argillaceous, common carbonaceous flecks.

FTD: 1400m

Appendix "A"

MWD Directional Surveys attached.....

Schlumberger

Survey

| MD (m) | Incl (°) | Azim (°) | TVD (m) | VSec (m) | NS (m) | EW (m) | Closure (m) | DLS (°/30m) | Comment |
|-----------|-------------|-------------|------------|-------------|-----------|-----------|----------------|----------------|---------|
| 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | |
| 363.00 | 2.20 | 81.2 | 362.91 | 1.07 | 1.07 | 6.89 | 6.97 | 0.18 | |
| 372.70 | 1.60 | 77.0 | 372.61 | 1.12 | 1.12 | 7.20 | 7.29 | 1.90 | |
| 382.20 | 2.10 | 74.9 | 382.10 | 1.20 | 1.20 | 7.50 | 7.59 | 1.59 | |
| 391.60 | 2.20 | 67.9 | 391.49 | 1.31 | 1.31 | 7.83 | 7.94 | 0.90 | |
| 401.10 | 2.30 | 77.7 | 400.99 | 1.42 | 1.42 | 8.19 | 8.31 | 1.25 | |
| 410.10 | 2.20 | 68.6 | 409.98 | 1.52 | 1.52 | 8.53 | 8.66 | 1.24 | |
| 419.60 | 2.50 | 72.8 | 419.47 | 1.65 | 1.65 | 8.89 | 9.05 | 1.09 | |
| 429.30 | 2.10 | 65.8 | 429.16 | 1.79 | 1.79 | 9.26 | 9.43 | 1.51 | |
| 438.90 | 1.90 | 66.5 | 438.76 | 1.92 | 1.92 | 9.56 | 9.75 | 0.63 | |
| 448.30 | 1.80 | 62.9 | 448.15 | 2.05 | 2.05 | 9.84 | 10.05 | 0.49 | |
| 457.70 | 1.70 | 51.7 | 457.55 | 2.21 | 2.21 | 10.08 | 10.32 | 1.14 | |
| 467.30 | 1.60 | 57.3 | 467.14 | 2.37 | 2.37 | 10.30 | 10.57 | 0.59 | |
| 477.00 | 1.50 | 58.0 | 476.84 | 2.51 | 2.51 | 10.52 | 10.82 | 0.31 | |
| 486.50 | 1.80 | 58.0 | 486.34 | 2.65 | 2.65 | 10.76 | 11.08 | 0.95 | |
| 495.90 | 1.90 | 60.1 | 495.73 | 2.81 | 2.81 | 11.02 | 11.37 | 0.39 | |
| 505.40 | 1.80 | 72.8 | 505.23 | 2.93 | 2.93 | 11.30 | 11.67 | 1.33 | |
| 515.10 | 1.30 | 60.1 | 514.92 | 3.03 | 3.03 | 11.54 | 11.93 | 1.87 | |
| 523.90 | 1.10 | 60.1 | 523.72 | 3.12 | 3.12 | 11.70 | 12.11 | 0.68 | |
| 533.60 | 1.10 | 70.7 | 533.42 | 3.20 | 3.20 | 11.87 | 12.29 | 0.63 | |
| 543.30 | 1.40 | 73.5 | 543.12 | 3.26 | 3.26 | 12.07 | 12.50 | 0.95 | |
| 553.00 | 1.20 | 71.4 | 552.82 | 3.33 | 3.33 | 12.28 | 12.72 | 0.64 | |
| 562.60 | 1.10 | 49.6 | 562.41 | 3.42 | 3.42 | 12.44 | 12.90 | 1.39 | |
| 572.10 | 1.20 | 48.9 | 571.91 | 3.55 | 3.55 | 12.59 | 13.08 | 0.32 | |
| 580.90 | 1.10 | 42.5 | 580.71 | 3.67 | 3.67 | 12.71 | 13.23 | 0.55 | |
| 666.50 | 1.20 | 83.0 | 666.29 | 4.38 | 4.38 | 14.16 | 14.82 | 0.28 | |
| 676.00 | 1.50 | 75.6 | 675.79 | 4.43 | 4.43 | 14.38 | 15.04 | 1.09 | |
| 685.00 | 1.70 | 75.3 | 684.79 | 4.49 | 4.49 | 14.62 | 15.29 | 0.67 | |
| 694.10 | 1.80 | 79.8 | 693.88 | 4.55 | 4.55 | 14.89 | 15.57 | 0.56 | |
| 703.90 | 1.80 | 84.7 | 703.68 | 4.59 | 4.59 | 15.20 | 15.87 | 0.47 | |
| 723.00 | 1.60 | 94.6 | 722.77 | 4.60 | 4.60 | 15.76 | 16.42 | 0.56 | |
| 732.60 | 1.40 | 89.7 | 732.37 | 4.59 | 4.59 | 16.01 | 16.66 | 0.74 | |
| 741.70 | 1.40 | 89.7 | 741.46 | 4.59 | 4.59 | 16.23 | 16.87 | 0.00 | |
| 751.20 | 1.70 | 80.2 | 750.96 | 4.61 | 4.61 | 16.49 | 17.12 | 1.25 | |
| 760.70 | 1.70 | 83.3 | 760.46 | 4.65 | 4.65 | 16.77 | 17.40 | 0.30 | |
| 770.20 | 1.80 | 79.8 | 769.95 | 4.70 | 4.70 | 17.05 | 17.69 | 0.46 | |
| 779.80 | 2.30 | 76.3 | 779.55 | 4.77 | 4.77 | 17.39 | 18.03 | 1.61 | |

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|---------|------|-------|---------|------|------|-------|-------|------|
| 789.40 | 1.40 | 100.9 | 789.14 | 4.79 | 4.79 | 17.69 | 18.33 | 3.69 |
| 798.80 | 1.50 | 113.6 | 798.54 | 4.72 | 4.72 | 17.92 | 18.53 | 1.07 |
| 808.40 | 1.90 | 99.5 | 808.13 | 4.64 | 4.64 | 18.19 | 18.77 | 1.80 |
| 818.00 | 2.10 | 100.9 | 817.73 | 4.59 | 4.59 | 18.52 | 19.08 | 0.64 |
| 827.60 | 2.40 | 96.0 | 827.32 | 4.53 | 4.53 | 18.89 | 19.43 | 1.11 |
| 837.20 | 2.30 | 112.9 | 836.91 | 4.43 | 4.43 | 19.27 | 19.77 | 2.18 |
| 846.80 | 2.00 | 128.3 | 846.51 | 4.26 | 4.26 | 19.58 | 20.04 | 2.03 |
| 856.50 | 1.70 | 140.3 | 856.20 | 4.04 | 4.04 | 19.80 | 20.21 | 1.51 |
| 866.20 | 1.90 | 131.1 | 865.90 | 3.82 | 3.82 | 20.02 | 20.38 | 1.08 |
| 875.80 | 1.90 | 125.5 | 875.49 | 3.63 | 3.63 | 20.27 | 20.59 | 0.58 |
| 885.40 | 1.50 | 124.1 | 885.09 | 3.46 | 3.46 | 20.50 | 20.79 | 1.26 |
| 894.90 | 1.80 | 126.5 | 894.58 | 3.31 | 3.31 | 20.72 | 20.98 | 0.97 |
| 904.50 | 1.40 | 112.9 | 904.18 | 3.17 | 3.17 | 20.95 | 21.19 | 1.72 |
| 914.10 | 1.80 | 110.1 | 913.78 | 3.07 | 3.07 | 21.20 | 21.42 | 1.27 |
| 923.80 | 1.80 | 95.3 | 923.47 | 3.01 | 3.01 | 21.50 | 21.71 | 1.43 |
| 933.00 | 1.60 | 101.6 | 932.67 | 2.97 | 2.97 | 21.77 | 21.97 | 0.89 |
| 942.20 | 1.50 | 92.5 | 941.86 | 2.94 | 2.94 | 22.01 | 22.21 | 0.87 |
| 951.70 | 1.80 | 98.8 | 951.36 | 2.91 | 2.91 | 22.28 | 22.47 | 1.11 |
| 961.40 | 1.60 | 98.1 | 961.05 | 2.87 | 2.87 | 22.57 | 22.75 | 0.62 |
| 971.00 | 2.00 | 101.6 | 970.65 | 2.81 | 2.81 | 22.86 | 23.04 | 1.30 |
| 980.50 | 2.40 | 104.4 | 980.14 | 2.73 | 2.73 | 23.22 | 23.38 | 1.31 |
| 989.50 | 2.80 | 100.9 | 989.13 | 2.64 | 2.64 | 23.62 | 23.77 | 1.43 |
| 998.90 | 3.30 | 100.2 | 998.52 | 2.55 | 2.55 | 24.11 | 24.24 | 1.60 |
| 1008.50 | 2.80 | 105.2 | 1008.11 | 2.44 | 2.44 | 24.61 | 24.73 | 1.77 |
| 1027.80 | 1.90 | 100.2 | 1027.39 | 2.26 | 2.26 | 25.38 | 25.48 | 1.43 |
| 1037.40 | 2.20 | 89.0 | 1036.98 | 2.23 | 2.23 | 25.72 | 25.82 | 1.56 |
| 1046.70 | 2.50 | 93.9 | 1046.28 | 2.22 | 2.22 | 26.10 | 26.19 | 1.16 |
| 1056.20 | 2.80 | 89.0 | 1055.77 | 2.21 | 2.21 | 26.54 | 26.63 | 1.19 |
| 1065.20 | 2.60 | 91.8 | 1064.76 | 2.21 | 2.21 | 26.96 | 27.05 | 0.80 |
| 1074.30 | 1.30 | 104.0 | 1073.85 | 2.18 | 2.18 | 27.27 | 27.36 | 4.47 |
| 1083.90 | 2.00 | 112.8 | 1083.45 | 2.09 | 2.09 | 27.53 | 27.61 | 2.32 |
| 1093.20 | 2.60 | 107.9 | 1092.74 | 1.96 | 1.96 | 27.88 | 27.95 | 2.04 |
| 1102.70 | 1.90 | 109.3 | 1102.23 | 1.84 | 1.84 | 28.23 | 28.29 | 2.22 |
| 1112.40 | 1.80 | 110.8 | 1111.93 | 1.74 | 1.74 | 28.53 | 28.58 | 0.34 |
| 1121.90 | 1.40 | 90.4 | 1121.42 | 1.68 | 1.68 | 28.78 | 28.83 | 2.18 |
| 1131.50 | 1.40 | 96.0 | 1131.02 | 1.67 | 1.67 | 29.02 | 29.06 | 0.43 |
| 1141.10 | 1.70 | 89.7 | 1140.62 | 1.66 | 1.66 | 29.28 | 29.32 | 1.08 |
| 1150.70 | 1.90 | 90.4 | 1150.21 | 1.66 | 1.66 | 29.58 | 29.62 | 0.63 |
| 1159.70 | 2.30 | 101.6 | 1159.21 | 1.62 | 1.62 | 29.90 | 29.95 | 1.90 |
| 1169.30 | 2.60 | 100.9 | 1168.80 | 1.54 | 1.54 | 30.31 | 30.34 | 0.94 |
| 1178.80 | 2.90 | 97.4 | 1178.29 | 1.47 | 1.47 | 30.76 | 30.79 | 1.09 |
| 1188.40 | 2.50 | 103.0 | 1187.88 | 1.39 | 1.39 | 31.20 | 31.23 | 1.50 |

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|---------|------|-------|---------|------|------|-------|-------|--------------------|
| 1197.90 | 1.80 | 108.6 | 1197.37 | 1.30 | 1.30 | 31.54 | 31.57 | 2.31 |
| 1207.50 | 1.80 | 108.6 | 1206.96 | 1.20 | 1.20 | 31.83 | 31.85 | 0.00 |
| 1217.00 | 1.70 | 105.8 | 1216.46 | 1.11 | 1.11 | 32.11 | 32.13 | 0.42 |
| 1226.00 | 2.30 | 107.2 | 1225.45 | 1.02 | 1.02 | 32.41 | 32.42 | 2.01 |
| 1235.60 | 3.00 | 109.3 | 1235.04 | 0.88 | 0.88 | 32.83 | 32.84 | 2.21 |
| 1244.80 | 2.50 | 113.6 | 1244.23 | 0.72 | 0.72 | 33.24 | 33.25 | 1.76 |
| 1254.40 | 1.30 | 110.1 | 1253.83 | 0.60 | 0.60 | 33.53 | 33.54 | 3.77 |
| 1264.00 | 1.10 | 100.2 | 1263.43 | 0.55 | 0.55 | 33.73 | 33.73 | 0.90 |
| 1273.50 | 1.00 | 105.1 | 1272.92 | 0.51 | 0.51 | 33.90 | 33.90 | 0.42 |
| 1282.70 | 0.80 | 61.9 | 1282.12 | 0.52 | 0.52 | 34.03 | 34.03 | 2.24 |
| 1292.20 | 1.10 | 86.1 | 1291.62 | 0.56 | 0.56 | 34.18 | 34.18 | 1.56 |
| 1301.60 | 1.50 | 80.5 | 1301.02 | 0.58 | 0.58 | 34.39 | 34.40 | 1.34 |
| 1311.20 | 1.80 | 74.9 | 1310.62 | 0.64 | 0.64 | 34.66 | 34.67 | 1.06 |
| 1320.70 | 1.90 | 68.6 | 1320.11 | 0.74 | 0.74 | 34.95 | 34.96 | 0.72 |
| 1330.00 | 4.30 | 57.2 | 1329.40 | 0.99 | 0.99 | 35.39 | 35.40 | 7.96 |
| 1339.60 | 5.50 | 55.2 | 1338.96 | 1.44 | 1.44 | 36.07 | 36.10 | 3.79 |
| 1349.20 | 6.60 | 55.9 | 1348.51 | 2.01 | 2.01 | 36.90 | 36.96 | 3.45 |
| 1358.80 | 7.10 | 58.0 | 1358.04 | 2.64 | 2.64 | 37.86 | 37.96 | 1.75 |
| 1368.30 | 7.60 | 61.5 | 1367.46 | 3.25 | 3.25 | 38.91 | 39.05 | 2.12 |
| 1377.90 | 7.40 | 67.9 | 1376.98 | 3.79 | 3.79 | 40.04 | 40.22 | 2.68 |
| 1387.50 | 6.80 | 70.7 | 1386.51 | 4.21 | 4.21 | 41.15 | 41.37 | 2.16 |
| 1400.00 | 6.00 | 75.2 | 1398.93 | 4.62 | 4.62 | 42.48 | 42.73 | 2.26 Extrapolation |